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TROPICAL DISEASES BULLETIN

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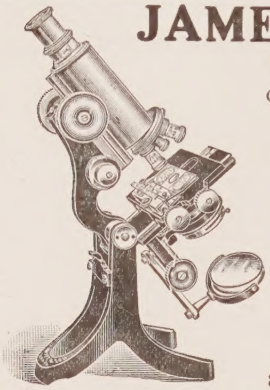

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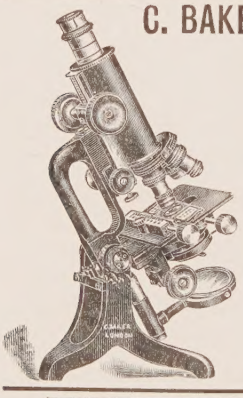

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TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 5.] 1915. [No. 6.

LEPROSY.

BLANQUIER (H.). **La Lèpre dans le Cercle de Touba (Côte d'Ivoire).**—*Bull. Soc. Path. Exot.* 1914. July. Vol. 7. No. 7. pp. 559–564.

In this district leprosy is at once extremely widespread and extremely irregular in its distribution. For example, one village of 227 inhabitants had 48 lepers and another of 266 had 36, while a third of 807 had only 5 and a fourth of 235 had only 2. It would appear that the percentage incidence is a rough measure of the duration of infection, and that the disease, once it attacks a village, tends to invade the whole population, progressing the more rapidly the wider its spread. One may find, e.g., the head of a house leprous, and also his first wife, her two sons and three daughters, his second wife and her son and daughter, as well as his two brothers all lepers—a family focus of infection which disseminates the disease as the daughters marry. It is less common in the north than in the south, and was apparently introduced from the north. The open sores, so common elsewhere, are rare here, and contagion appears to be from mother to infant (either *in utero* or in early childhood) or through parasites (scabies), but tatoo scars were often seen in the centre of leprous lesions, and conjugal transmission and nasal contamination are possible. The writer considers segregation and immediate separation of the child at birth from the leprous mother to be the only method of control possible in this region. He gives a rough table, based on a large number of cases, of the lowest age at which he found the lesions to occur, and it would be valuable to have the experience of others on this point. It is as follows :—

Before 2 years old : Swelling of face, conjunctivitis, nasal discharge. At 2 years old : Change in skin colour, pale patches, chiefly on face, with smooth surface. At 6, patches with a raised, often reddened margin, and more or less confluent. At 10, simple scars, more or less radiating, not cheloid. At 15, tubercles, from simple swelling to an appearance almost of elephantiasis. At 20, colourless patches. At 25, cheloid scars, with tense bands. At 35, skin shiny and dry-looking. At 40, deformations. At 45, mutilations.

J. Henderson Smith.

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Dalziel (L. M.). **The Relation of Fish to Leprosy in Northern Nigeria.** (Correspondence).—*Lancet.* 1914. Aug. 22. p. 525.

Balfour (Andrew). **The Relation of Fish to Leprosy.** (Correspondence). —*Ibid.* Sept. 12. p. 718.

Dalziel has already published an account (extracted in *Jl. Trop. Med. & Hyg.*, 1912, p. 70) of leprosy in Sokoto, in which he estimates the incidence of the disease in this province to be as high as 52 per 10,000. The native view is not that *dried* fish as such is the cause of the disease, but certain kinds of fish are suspected, even when fresh. All native opinions of this kind must be received with scepticism; e.g., the white spots and stripes of the bush-buck suggest to the native the leucodermatous patches of leprosy and he infers a connection between them, and it is possible that the smooth, slimy and often maculated skin of the catfish has given rise to the current belief. But it is worth noting that "while all beliefs incriminate a variety of foodstuffs, fish of one or a few defined species are common to all," and in most of the cases definitely observed the species belonged to the family of catfish (*Siluridae*).

Balfour draws attention to Anderson's report (1908), in which mudfish, prepared by opening and drying in slices in the sun or smoke, were stated to be popularly associated in South Kordofan with leprosy. This fish Balfour found to belong to the genus *Clarias* of the *Siluridae*.

J. H. S.

De Beurmann & Anglada (Mlle.). **Lèpre Conjugale. Contamination probable du Mari par la Femme, Présentation de Malades.**—*Bull. et Mém. Soc. Méd. de Paris*, 1914. Nov. 19. 3e Ser. Vol. 30. Nos. 31–32–33. pp. 349–357.

The first symptoms appeared in the wife in 1909 and in spite of treatment the disease continued to develop as a progressive and exclusively tubercular leprosy. In 1911 the first sign appeared in the husband, a macule, and there is little doubt that he suffers from the nervous type of the disease. Both patients come from the Argentine, where the wife's symptoms appeared, and one cannot exclude the possibility that both were infected there independently. The authors, who are convinced of the contagiousness of leprosy, discuss the explanations which have been offered of the apparently much greater communicability in countries where it is common than in countries such as France, and deprecate as alarming and unnecessary the adoption of any rigorous measures of isolation and notification in the latter.

J. H. S.

Lama (A.). **Contributo alla Epidemiologia della Lebbra.**—*Giorn. Ital. Mal. Ven.* 1914. Vol. 49. pp. 465–472.

The writer suggests that leprosy is frequently carried by the Chigger (*Sarcopsylla penetrans*). In 12 cases he elicited a history of apparent infection by this insect 12 to 14 years before the appearance of leprosy symptoms, and he supports the idea by pointing out that the early lesions in leprosy appear most frequently in the uncovered parts of

the body, that the Chigger invasion usually produces a considerable irritation of the lymphatics in its neighbourhood, and that it also attacks rats. [His assertion that the geographical distribution of the insect covers the active foci of the disease is scarcely correct.]

J. H. S.

Balliano (Arturo). **Un Caso di Lebbra all'Ospedale Militare Principale di Savigliano.** [Case at the Chief Military Hospital at Savigliano (Piedmont).]—*Giorn. Med. Milit.* 1914. May 31. Vol. 62. No. 5. pp. 349–366. With 4 figs.

A detailed clinical account, with general discursus on the spread of leprosy, of a case of mixed type coming from Brazil. It is worth remark that even two centigrammes of pilocarpin subcutaneously did not induce sweating, which was ordinarily almost absent not only in the anaesthetic, macular or nodular areas but also over the whole skin, even where apparently healthy.

J. H. S.

Balliano (Arturo). **Un Ascaro affetto da Lebbra all'Ospedale Militare Territoriale di Tripoli.** [Case of Leprosy in an Askari at Tripoli Military Hospital.]—*Giorn. Med. Milit.* 1914. Nov. 30. Vol. 62, No. 11. pp. 930–932. With 1 plate.

Clinical account of tuberculous leprosy in a native of Eritrea, fairly typical but with no nodules on the ear-lobes. Besides progressive weakness the early stages were noticeable for hyperaesthesia of hands and feet, to such a degree that the inequalities of the road, such as small stones, caused severe pain on walking. No change observed in the tongue, mucosa of mouth or nose, nor in the conjunctiva ; loss of thermal sensibility in both lower limbs, and in zones on trunk and arms, but tactile and pain sensibility maintained.

J. H. S.

Serra (Alberto). **Su la Broncopolmonite Leprosa.**—*Sperimentale.* 1914. Dec. 11. Vol. 68. No. 5. pp. 661–684. With 1 plate.

A detailed account of the pulmonary condition before and after death in a case where the lesions appear to have been due to the leprosy bacillus alone and not to a concomitant tuberculosis. The disease was extensive throughout the body, but in the one lung was found a chronic bronchopneumonia with distinct small hard scattered foci and on the same side a chronic nodular pleurisy. Numerous cultures from lung, pleura and other parts of the body were all negative, and inoculations with pulmonary nodules, peribronchial glands, etc. into the eye of rabbits and the peritoneum and subcutaneous tissue of guinea-pigs were also negative. The affected tissues were full of acid-fast rods having the characters of leprosy bacilli. During life Serra failed with the tuberculin cuti- and ophthalmo-reaction to get a positive result, and frequent sputum examinations were always negative.

He has only once in 15 cases of leprosy (7 anaesthetic, 3 tubercular, 5 mixed) obtained a positive tuberculin reaction, and that in a case which subsequently developed a genuine tubercular phthisis, and he thinks that pulmonary leprosy is not only possible but also not infrequent.

J. H. S.

JEANSELME (E.). **De l'Uréthrite Lépreuse.**—*Bull. Soc. Path. Exot.* 1914. July. Vol. 7. No. 7. pp. 557–559. With 1 text fig.

Urethritis due to leprosy is mentioned but rarely in the literature, and Jeanselme describes a case in which he found the glans covered by lepromata, of which one around the meatus had infiltrated the walls of the urethra. Pressure expressed a few drops of a purulent fluid in which were found leucocytes stuffed with acid- and alcohol-fast rods, typically lepra bacilli. Jeanselme's attention was drawn to it by difficulty in micturition, and he believes that this method of bacillary discharge is much more common than is generally believed.

J. H. S.

KHOURY (Alfred). **Deux Cas de Vitiligo Syphilitique. Importance de la Pathogénie Syphilitique du Vitiligo dans les Foyers Endémiques de Lèpre.**—*Bull. et Mém. Soc. Méd. de Paris.* 1914. July 16. 3e Sér. Ann. 30. No. 25. pp. 85–89. With 1 text fig.

A syphilitic origin of vitiligo is coming more and more to recognition, and Khoury adduces two cases in which the connection appears distinct enough. It is, however, difficult in countries where leprosy is endemic to distinguish the vitiligo of syphilis from that of leprosy, and here the Wasserman reaction may be of no assistance. Certain points may help in the differential diagnosis. In leprosy the spots are rarely very large, they take years to develop and spread, are rarely so completely colourless and in their advanced stages are nearly always accompanied by local disturbances of sensation. Further, they are usually of quite secondary importance to the other evidences of the disease, whereas the vitiligo of syphilis may be almost the only manifestation, and is usually the most prominent one, present.

J. H. S.

FALCÃO (Zeferino). **Lepra Unilateral.**—*Med. Contemporanea.* 1915. Feb. 15. Vol. 33. No. 7. pp. 49–52. With 4 figs.

An account of a case of leprosy in a man aged 45 in which the lesions were exclusively situated on the left side of the body. There was a nodule on the left cheek and another on the left side of the chin, terminating abruptly in the middle line, two similar nodules on the left forearm and the left thigh and one as large as the palm of the hand on the left buttock. The fingers of the left hand were strongly clawed, and there was extensive anaesthesia of the hand and forearm. These lesions had existed without much alteration, and without any extension to the right side of the body for nearly twenty years.

J. B. Nias.

Rivas (D.) & Smith (Allen J.). **The Bacteremic Nature and Laboratory Diagnosis of Lepra.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1914. Nov. Vol. 2. No. 5. pp. 327–332. With 1 plate.

In two cases of leprosy the authors demonstrated acidfast bacilli in smears of blood obtained by pricking the skin in apparently unaffected parts, and also in smears of blood withdrawn from a vein. To 1 vol. of blood they add 10 vols. of 2 per cent. acetic acid, and make slides from the deposit after centrifugation. They state that the bacilli were then found singly or in clumps, in lepra cells, endothelial cells and lymphocytes ; that the acetic acid solution was repeatedly filtered through porcelain and was free from acidfast organisms; and that no acidfasts were found in slides similarly prepared from healthy or tubercular persons. The authors no longer claim that they obtain growth on their trypsinised egg-medium inoculated with leprosy material.

J. H. S.

Hurley (Victor). **A Case of Leprosy (Mixed Type).** *Med. Jl. of Australia.* 1914. Aug. 15. Vol. 1. No. 7. p. 154.

A case in a Russian Jew of at least three years standing. The source of infection is obscure. The patient had been 28 years in Australia and had seemingly never come in contact with leprosy during that time.

J. H. S.

Heiser (Victor G.). **Leprosy. Its Treatment in the Philippine Islands by the Hypodermic Use of Chaulmoogra Oil Mixture.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1914. Nov. Vol. 2. No. 5. pp. 300–326. With 11 plates and 18 diagrams; & *U. S. Public Health Reps.* 1914. Oct. 16. Vol. 29. No. 42. pp. 2763–2767. [A Shorter Account].

In the Philippines every known method that did not seem dangerous has been tried in turn, most of them without effect. Several cases were apparently cured by X-rays, others by the use of crude chaulmoogra oil by the mouth, but the disease always returned before the end of one year. In 1907 Dyer's method of giving chaulmoogra oil was tried. The results were better, but after a few months the nausea nearly always became so great that in spite of every endeavour to avoid this complication, treatment had to be given up. On hypodermic injection the oil was insufficiently absorbed, but with the addition of camphor the results were more successful, and finally the following mixture was used with most satisfactory results :—

Chaulmoogra oil 60 c.c. ; camphorated oil, 60 c.c. ; resorcin, 4 grams. (Mix, dissolve by aid of heat over a water bath, and filter).

At weekly intervals starting with 1 c.c. increasing doses are given until the limit of tolerance is reached. This varies in each case, and it is apparently better when possible to inject the mixture into large leprous deposits or into a number of smaller infiltrations. No strychnine is given, but saline purgatives freely, and 2 per cent. hot baths of sodium bicarbonate are prescribed every other day with

apparently very good effect. This method in twelve cases has given most satisfactory results in all forms of the disease, producing apparent cure in some, great improvement in others and arrest in all, and it is hoped that a more extensive trial will confirm the results. The writer notes that he has often been struck with the frequency with which cases of leprosy present histories of scabies. J. H. S.

IREDELL (C. E.). **A Case of Leprosy treated with Radium & Diathermy.** —*Lancet.* 1914. Dec. 5. pp. 1299–1300.

The disease in this case in a doctor was characterised at first by maculae, two lepromes, neuritic affections including local anaesthesia and ulnar pain, and intestinal troubles, both pain and constipation. The maculae passed off spontaneously, as also one leprome. The second leprome appeared to respond to radium applications. But the effect of diathermy on the ulnar pain and the abdominal condition was very definite. The former was greatly relieved in 20 minutes, and to a much greater extent than by hot baths, etc. for the arm, and the treatment produced copious evacuation of the bowels without any drugs. It would seem that the method is worth a more extensive trial, not only as a relief to the pain but as a means towards real improvement in the disease. J. H. S.

COURTNEY (B. J.). **The Treatment of Leprosy by Intravenous Injections of Iodoform.**—*Lancet.* 1914. June 27. pp. 1806–1808.

Twelve patients, four of them purely nodular cases, five purely anaesthetic and three mixed, received intravenously iodoform dissolved in ether over a period of at least three months. The initial dosage was ½ grain twice weekly, and this was increased to 1 grain five times a week. In four of the cases local injections were made in addition into some of the nodules. No change was produced in the anaesthetic cases, four of which were advanced. In the tubercular type a definite improvement took place in three out of the four, and two of the mixed cases were greatly improved in regard to the nodular aspect of the disease. In 6–12 weeks the nodules softened and broke down, discharging a thin pus containing many bacilli, and the leprotic deposits sloughed, leaving a clean surface which healed without difficulty. The improvement was general over the whole body, and not confined to the areas of local injections. The leonine expression disappeared, thickened ears and lips went down, the skin round the ulcers was smooth and normal, and the patients felt themselves markedly better. The change resembled that which occasionally occurs spontaneously in the tubercular type of case, but its simultaneous appearance in five cases, and the extent of the improvement, make spontaneous change an improbable explanation in these cases.

It may be noted that in Sokoto, where the cases were treated, the natives attribute leprosy to the eating of fish. The method of preparation is to open and roughly dry in smoke, but the process is so imperfect that the fish is really often partly rotten. Further it is not with the eating of all fish but only certain kinds of fish that the disease is connected. J. H. S.

Williams (A. Winkelried). **Case of Leprosy.**—*Proc. Roy. Soc. Med.* 1914. Dec. Vol. 8. No. 2. (Dermat. Sect.). p. 39.

A nodule from the face of a tubercular case was excised, dried, ground, the contained organisms were roughly counted and $2\frac{1}{2}$ millions, and later 5 millions, injected as a vaccine. A reaction followed the last dose, in the form of a transient eruption of erythematous patches; an ulcer on the knee healed up, nasal discharge ceased, the nodules largely subsided, and sensation to pain partly returned. Oleum gynocardiae by the mouth, and local nasal treatment had also been given.

J. H. S.

Käyser (J. D.). **Ueber Aetiologie, Prophylaxis und Therapie der Lepra.**—*Dermatol. Woch.* 1914. May 30. Vol. 58. No. 22. pp. 621–635; June 6. No. 23. pp. 651–660.

After an interesting historical account of the spread of leprosy, at the end of which he states that the decline and practical disappearance are certainly not due to attempts at isolation and probably not to any acquisition of immunity, but rather to the general improvement in hygienic conditions, Käyser epitomises the current views on the etiology, etc. of the disease, and gives a general review of its prophylaxis in the light of his experience in Batavia. He recognises the disease to be contagious, but the rarity of this event and the failure of Danielssen and also of Profeta to confer the disease on any of 31 individuals (including themselves) whom they inoculated with leprous material, show that there must be other conditions besides simple invasion of the bacillus. These conditions are quite unknown, but it appears clear that leprosy is a disease which finds its best soil in the presence of poverty, dirt and the low physique of insanitary surroundings. The real preventive treatment is, therefore, sanitation and cleanliness, and were it possible to ensure even that the already infected were personally cleanly, slept alone, covered their ulcers and never allowed their clothes to be worn or their eating utensils to be used by others, further measures would be almost superfluous. This is impossible in practice. It might be achieved by isolation, but enforced isolation is a measure unnecessarily stringent and in practice cannot be attained in the countries where the disease is most prevalent, scarcely even amongst the civilised. It is probably impossible to lay down a rule of procedure that would be practicable in every land. The local habits, circumstances, prejudices of the people in each country must be separately studied, and the prophylactic measures adapted to the local needs.

Käyser adduces as example the measures which were adopted by himself and De Jonge in the Dutch East Indies. They began by studying the conditions in the native quarters of Batavia. The necessity of immediate help was found so general that they instituted a nursing system at once, with the hope that thereby they might also gain the confidence of the natives. This succeeded well with the Malays and Javanese, hardly at all with the Chinese. The cases were pointed out by the natives themselves, and the obvious improvement which followed the regular treatment led to further notification (up to 200 cases) and to a definite betterment of the condition of the sick.

Their experience convinced them that enforced isolation was impossible in Batavia, not only because of the cost but because of the native love of independence, which would have led to general concealment. (The leper in these regions is not a pariah, whom friends would be glad to disclose). They accordingly extended the system of local nursing, and began the foundation of numerous small local homes where lepers might come voluntarily for treatment and temporary isolation without feeling that they were cut off from their friends. They are strongly in favour of such decentralisation and opposed to all compulsory isolation, which has never in their opinion, not even in Norway, achieved its aim. No doubt in civilised lands, where the cases are mostly imported and relatively few in number, some system of nursing homes might be advisable for those who could not carry out treatment in their own houses, but the essence of success must lie in the inducement of highly skilled treatment, not in enforcement. Leprosy is a curable disease, and a sanatorium method of treatment might work as well as in tuberculosis. But drugs are of great value, especially chaulmoogra oil, combined with hot baths and local treatment. The author gives a detailed consideration to the origin and claims of Nastin, and adheres to his opinion that it has not been shown to be of any real value whatever.

J. H. S.

Rucker (W. C.). **The Necessity for the Establishment of a National Leprosarium.**—*Jl. Amer. Med. Assoc.* 1914. July 25. Vol. 63. No. 4. pp. 297–298.

Dyer (Isadore). **The Duty of the Government in Leprosy Care and Control.**—*Ibid.* pp. 298–300.

Rucker, Assistant Surgeon-General in the U.S. Public Health Service, and Dyer draw attention in these papers to the advisability of national legislation for the control of leprosy in the United States, and the former submits a draft of an Act for the establishment of a leprosarium. The official records of the prevalence of the disease are misleading. There are several well-established foci in the country, and the disease is slowly spreading in spite of the almost hysterical dread of leprosy amongst the population. There is no federal mechanism for dealing with it. A recognised leper immigrant is rejected, and should the disease develop within three years of the arrival of an immigrant he may be deported, if it can be proved that he was already infected at the time of immigration. Beyond this there is no national control. In most States the disease is notifiable, and in three there are leprosaria, very costly to maintain because of the small number of patients they take and quite inadequate to the requirements. The need is urgent, not only for the sake of the lepers themselves, since the recognised sufferer is a pariah whose life is a misery, but from motives of self-defence. The only known controls are segregation and cleanliness and, in the impossibility as yet of achieving a general high standard of cleanliness and sanitation, the only remedy is isolation.

J. H. S.

Wolbach (S. B.) & Honeij (James A.). **A Critical Review of the Bacteriology of Human and Rat Leprosy.**—*Jl. of Med. Research.* 1914. Jan. Vol. 29. (New Ser. Vol. 24). (Whole No. 142). pp. 367–423.

This review endeavours so to summarise the literature as to render reference to the original papers unnecessary and, if it does not quite do that, it is still an excellent resumé. It can hardly be itself summarised here, but one or two points may be extracted. Twenty-six authors have given descriptions of leprosy cultures that are worth consideration. These cultures fall into four groups: (1) The diphtheroid, partially acid-fast bacilli: Babes and Kedrowski type: 14 authors; (2) pigment-producing acid-fast organisms: Rost and Clegg: 5 authors; (3) anaerobic acid-fast bacilli: Ducrey and Campana: 3 authors; (4) acid-fast organisms not producing pigment: Karlinski and Duval: 5 authors. The first and second types certainly, and possibly the third and fourth types, are to be found not infrequently in leprous tissue. The diphtheroids have been found in all parts of the world; the pigmented acid-fasts chiefly in the Philippines and Louisiana, but independently and by competent workers. The known variability in the staining reactions of the leprosy bacillus as it occurs in the tissues makes it difficult to assess the value of arguments from the staining reactions of cultures, and the known variability of organisms such as tubercle in regard to acid-fastness accentuates the difficulty. Animal experiments on the whole have given no conclusive results. Direct inoculation of tissue bacilli has rarely given any results and probably none beyond criticism, and the inoculation with culture material, though more often successful, has up to now given nothing definite either. Immunity reactions are still irregular and inconclusive.

J. H. S.

Duval (Charles W.). **The Behaviour of the Hansen Bacillus in vitro.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1914. Sept. Vol. 2. No. 3. pp. 185–190.

A statement of the writer's present position on this question of the causal organism of leprosy. The fact that an organism has been cultivated from leprous tissue means little in itself. Most leprous lesions on the surface of the body contain extraneous organisms. When these are banal cocci or other well-known bacteria they present no difficulty; but many lesions contain diphtheroid or streptothrical forms and acidfast rods, and these are the source of confusion. Such organisms occur freely in definitely non-leprous lesions, and are often capable of cultivation. They have been found by Lanford, Harris and Wade in chronic acne, tuberculosis of lungs and cervical glands, sporothricoid gummatoid lesions, lymph nodes and spleen in lymphosarcoma, in the skin lesions of pellagra, etc.; it is remarkable in fact how seldom they are absent. The isolation of such organisms from leprous lesions means practically nothing. Further, according to Duval, these organisms cannot be distinguished by experimental or serological methods from saprophytes which have long been well-known. He has therefore attempted to obtain cultures from leprous

tissue, in which such organisms did not occur. He rejected all cultures in which appeared diphtheroid, streptothrical or acid-fast rods not morphologically quite like the tissue Hansen bacilli, and has five times isolated acidfast bacilli closely resembling the organisms found in the lesion itself. These he regards as the true *B. leprae*.

Absolute identification of his bacillus with that of Hansen he realises to be at present impossible, because the experimental animal lesion and the serum reactions are not specific, either for his or for any other of the so called leprosy bacilli, and his organism does not, any more than they do, satisfactorily give such tests as would prove causal relationship. His belief therefore rests solely on the morphological and tinctorial characters of his organism, and the fact of its isolation, in five instances, in pure culture from leprous tissue. In culture it has retained its characters unchanged for two years. It invariably resists decolorisation in 30 per cent. nitric acid followed by 95 per cent. alcohol, or in Gabbett's solution, and is as resistant as the tubercle bacillus, whether dead or alive. It varies from a solidly staining rod with tapering or swollen ends to an irregular, beaded, slightly curved and slender bacillus. Short bipolar forms with clear centres are common, also solidly staining spindles with very swollen centres, and the occurrence of these two forms is characteristic of the organism. Multiplication occurs in excised leprous tissue at 25°–37° aerobically, usually readily enough if autolysis occurs, but always slowly, 8–10 weeks elapsing before macroscopic colonies appear. Subculture on artificial medium occurs only when the medium contains split products of animal protein and always very slowly.

J. H. S.

Johnston (John A.). **Contribution to the Bacteriology of Leprosy. Preliminary Note.**—*Philippine Jl. of Sci.* Sect. B. Trop. Med. 1914. June. Vol. 9. No. 3. pp. 227–230. With 1 plate.

Johnston has twice cultivated post-mortem from the spleen of lepers a non-acidfast streptothrix, and from animals inoculated with this organism (apparently identical in the two cases) has occasionally recovered acidfast rods. Details of the culture, etc. are given, but the investigation is not yet complete.

J. H. S.

Kendall (A. I.), Day (A. A.) & Walker (A. W.). **The Metabolism of "Lepra Bacillus", Grass Bacillus, and Smegma Bacillus in Plain, Dextrose, Mannite and Glycerin Broths. Studies in Acid-Fast Bacteria. V.**—*Jl. of Infect. Dis.* 1914. Nov. Vol. 15. No. 3. pp. 439–442.

The writers had previously found that avirulent rapidly growing tubercle bacilli developed two phases of growth on broth, either with or without the addition of glucose, mannite or glycerin. The first phase was characterised by an increased accumulation of ammonia up to a maximum in the medium, the second by the gradual diminution and disappearance of this ammonia. In this respect they found the grass and smegma bacilli to agree with tubercle, but Duval's leprosy bacillus scarcely produced any ammonia at all.

J. H. S.

Mercier (Charles A.). **Leper Houses and Mediaeval Hospitals. Lectures 1 and 2. Being the "Fitzpatrick Lectures" delivered before the Royal College of Physicians, London.**—*Glasgow Med. Jl.* 1915. Jan. Vol. 83. (New Ser. Vol. 1.) No. 1. pp. 1–20; Feb. No. 2. pp. 81–103 & *Lancet.* 1915. Jan. 2. pp. 33–36; Jan. 9. pp. 89–92. (Abstract).

It is known that there was at least one leper house in Constantinople in the 4th century, and most probably there were others in existence previously of which we have no record. They were not exactly hospitals in the modern sense. The object of their formation was not so much the treatment of the afflicted as their compulsory isolation and although the inmates were usually humanely and sometimes munificently treated, there were rigid penal rules against their leaving their appointed seclusion. The leper on entering such a house withdrew from the world, his goods were disposed of, his wife might marry again, and he became in all respects as one dead. Such segregation is a very ancient practice. It may have been due originally to the belief that the leper is one marked by God as accursed, but certainly the idea of contagiousness is of very ancient standing, and the eventual great development of leper houses was probably an attempt to control the spread of the disease. In the 13th century there were reckoned to be 2,000 such houses in France, and there is ample evidence of the enormous prevalence of the disease in the Middle Ages. Every rank of society was affected by it, and it took the place which pulmonary phthisis occupies to-day.

Its decline was much more rapid than its long centuries of severity might have suggested. In France no leper houses were founded after the 14th century, and in England (where it was probably never so widespread) very few after the 13th century, and by the 15th century patients were so few that most of the houses were being closed and converted to other uses. It is very difficult to account for this decline. The isolation practised, though much more thorough and general than the sanatorium isolation of phthisis to-day, can hardly have been more than a contributory cause, and no really satisfactory explanation has yet been brought forward. Mercier propounds the interesting hypothesis that the phthisis of the present day is the lineal successor and direct descendant of the leprosy of the Middle Ages. Phthisis was not then the scourge it is now, and has increased since leprosy disappeared, and the well-known resemblance between the causal organisms lends an attractive plausibility to the suggestion. But the hypothesis has no solid basis of support.

J. H. S.

Hill (H. W.). **The Non-Indentity of Modern Leprosy and Biblical Leprosy.**—*Amer. Jl. Public Health.* 1914. July. Vol. 4. No. 7. pp. 605–608.

In Tsaraath, the Hebrew word which the translators of the Bible rendered as leprosy, the lesions are described as being under the skin and not in it, and diagnosis was complete only if the lesions enlarged noticeably in one or at most two weeks. In both points

it differs from modern leprosy. Further, it is nowhere stated that Tsaraath was infectious or incurable. The identification of the two Hill considers to be unjustified, and to be largely responsible for the horror with which leprosy is regarded nowadays.

J. H. S.

McCoy (Geo. W.). **Avian Tuberculosis in Man resembling Leprosy. An Abstract of a Report of a Case of Skin Tuberculosis caused by the Avian Type of the Tubercle Bacillus.**—*U. S. Public Health Rep.* 1915. Jan. 1. Vol. 30. No. 1. pp. 14–15.

An abstract of a case (reported by Lipschütz in the *Archiv für Dermatologie und Syphilis*, June, 1914) where the skin was invaded by the avian tubercle bacillus, producing lesions simulating tuberculous leprosy. The patient was a young male adult from Bosnia, a leprosy centre, and the case had been diagnosed as lupus, as syphilis and as a combination of the two. He gave a positive tuberculin reaction and a negative Wassermann. In the early stage the lesions were chiefly ulceration and thickening of the oral mucosa with ulceration of the nose and upper lip, and as the disease progressed pigmented infiltrated spots appeared on the arms and body, with ultimately development of soft elastic subcutaneous tumours here and there. The metacarpal bones were carious, fistulae developed from them and two months before death the subcutaneous lesions discharged pus containing enormous numbers of acid-fast and alcohol-fast bacilli, longer than typical tubercle or lepra bacilli but grouped in the manner of leprosy and many contained in leucocytes. They were present in the ulcers on the hard palate, nasal septum and in the internal organs. Inoculation into animals resulted eventually in successful cultures, which were slightly pathogenic for rabbits and guinea-pigs, and markedly for fowls, and there seems no doubt they were avian tubercle bacilli. Human cases of infection with this organism have been reported before several times, but this appears to be the first where the skin lesions were the prominent feature, and the condition resembled leprosy so closely not only in clinical appearance but in the numbers and grouping of the organisms that only cultural and animal tests could establish a diagnosis.

J. H. S.

De Azevêdo (Paes). **A Lepra dos Ratos no Brazil.** [Rat Leprosy in Brazil].—*Brazil Med.* 1913. Aug. 22. Vol. 27. No. 32. p. 333.

Rat leprosy has not hitherto been reported from Brazil. The author, however, found two rats thus affected out of one lot of 64 sent to the San Paulo Bacteriological Institute to be examined for plague bacilli. Out of another lot of 1,185 sent three months later two more rats were found showing signs of leprosy. Inoculations into guinea-pigs proved unsuccessful, as were cultures upon different media, but eight white laboratory rats were inoculated successfully.

J. B. Nias.

MALARIA.

Walker (Ernest Linwood) & Barber (Marshall A.). **Malaria in the Philippine Islands. I. Experiments on the Transmission of Malaria with *Anopheles* (*Myzomyia*) *febrifer* sp. nov., *Anopheles* (*Pseudomyzomyia*) *rossii*, *Anopheles* (*Myzorhynchus*) *barbirostris*. *Anopheles* (*Myzorhynchus*) *sinensis*, and *Anopheles* (*Nyssorhynchus*) *maculatus*.—*Philippine Jl. of Sci.* Sect. B. Trop. Med. 1914. Sept. Vol. 9. No. 5. pp. 381–439.

This important paper takes as its text the statement that in the sanitation of the Panama Canal Zone between 100,000 and 250,000 dollars were saved by the knowledge that *Anopheles malefactor*, which breeds in water collections in hollow stumps, resulting from extensive deforestation of the country, was unable to transmit malaria.

The authors therefore affirm that "an antimalarial campaign in any country must be based not only upon accurate information of the anopheline mosquitoes and their distribution, but also upon the experimental determination of the ability of the different species to transmit malaria."

They point out that of the 100 species of Anophelinae now known, probably less than one-third have been definitely proved to be capable of transmitting malaria. As they say :—

"The remaining species either have not been investigated or the evidence of their susceptibility is inconclusive or contradictory. Furthermore, it has been demonstrated that among the anophelines capable of transmitting malaria the different species vary widely in their susceptibility to infection with the malarial parasite and that the same species may not be capable of serving as vector of all three types of human malaria. Finally, it should not be overlooked that the same species of anopheline may vary in its susceptibility to infection with the malarial parasite in different countries or under different ecologic conditions. Such variations have been recorded in the susceptibility of *Glossina morsitans* to infection with *Trypanosoma rhodesiense*. A similar variation in susceptibility may account in part for the contradictory results obtained by different authors in their dissections of, or experiments with, certain anopheline mosquitoes."

The authors discuss the two methods of determining the susceptibility of an anopheline to infection with malarial parasites, and decide that the method of experimental infection, as opposed to the mere dissection of mosquitoes caught in houses harbouring cases of malaria, is the more reliable.

They consider that if a mosquito can be infected, and if the parasites develop sporozoites which reach the salivary glands, the evidence that this mosquito is a carrier is nearly, if not wholly, complete, apparently rendering unnecessary feeding experiments on healthy subjects. The importance of instituting careful comparative tests for the purpose of determining the relative susceptibility of different species of anophelines is insisted upon, a line of enquiry which has been largely neglected in the past. The authors indicate how such a research should be carried out, and state that while susceptibility to infection is the most important factor in determining the part played by any species of mosquito in malaria transmission, the questions of geographical distribution, of prevalence of the species, of habitat in relation of human dwellings (domesticity), of avidity for human blood, all merit consideration and must be determined separately for each species.

A list of Philippine anophelines is given. Of these the following five formed the subject of experiment:—*Anopheles febrifer* Banks, sp. nov., *Anopheles rossii* Giles, *Anopheles barbirostris* van der Wulp, *Anopheles sinensis* Wiedemann, and *Anopheles maculatus* Theobald emend. Stanton. Two of these were not hitherto regarded as Philippine species at all, as shown by their absence from the above-mentioned list, and one, as will be noted, is a new species. An account of all these anophelines, with notes on their synonymy and breeding habits, follows, and this is of special interest in view of recent papers by Stanton and Strickland on Malayan species. [See this *Bulletin*, Vol. 2, pp. 650–1.]

A lengthy section deals with methods. All the mosquitoes used were collected as, and bred from, larvae, and useful hints are given on the collection of larvae, stress being laid on the necessity of securing very large quantities of the wrigglers. The method used for breeding the imagines from the larvae is detailed. After several failures the authors discovered the value of filling the bottom of the cage with washed sand. [Although they do not mention the fact, it is evident that experience led them to adopt a technique resembling that employed and figured by Eysell.*]

In selecting patients for infecting the mosquitoes care was taken to see that gametes existed in the blood in sufficient numbers and mention is made of Darling's estimate, which is to the effect that the limits of infectiousness of man to mosquitoes is about 1 gamete to 500 leucocytes, or 12 gametes to a cubic millimetre of blood. In all cases an effort was made to obtain patients with as high a gamete count as possible. The technique for infecting the mosquitoes is fully described, as is that for mosquito dissection. [In this connection one may note that the authors were apparently not acquainted with the "bile method" recommended by Perry,† which is said greatly to facilitate insect dissection.]

The account of the experiments themselves is purposely given in great detail both in the form of tables and in the text. In a brief summary it is only possible to indicate the various points which are discussed more or less fully by the authors. Thus there are notes on the development of anopheline larvae in captivity; on the proportion of females to males amongst the anopheline bred from larvae in captivity; on the longevity of anophelines in captivity, a fair proportion surviving for from 5 to 18 days; on the avidity of the several species of anophelines for human blood, *Anopheles sinensis* taking first place; and on certain other matters such as the gamete count and the influence of quinine on the percentage and intensity of infection of the mosquitoes. In the quantities in which it was taken by the patients it did not appear to have any influence whatsoever.

There were 184 experiments in all, and 1,287 female anophelines were dissected, of which 205—or 15·92 per cent.—contained oöcysts in their mid-guts or sporozoites in their salivary glands. A table gives the percentages of infection for the five different species, but it is to be noted that there were not nearly so many *A. sinensis* and *A. maculatus* examined as of the remaining three species.

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*Mense's *Handbuch der Tropenkrankheiten*, 2nd Edition. Vol. 1, p. 129.
†*Paludism.* No. 5. Sept., 1912; and this *Bulletin.* Vol. 1, p. 117.

Other tables show the infections with the different species of malarial parasites and give details with regard to salivary gland infection, including information as to the date after feeding on which sporozoites were found in the glands.

In their own summary the authors discuss some interesting points, but here it is only necessary to quote their conclusions.

They state that "the importance of the 5 species of Anophelinae, investigated in the transmission of malaria in the Philippines, can be roughly estimated as follows :—

"*Anopheles maculatus* is probably a moderately susceptible, semi-wild species, with a moderate avidity for human blood; but on account of its very local distribution it probably plays a very small part in the transmission of malaria in the Philippines, especially in the lowlands. It is said to be primarily a highland species, and if it should be found to be more prevalent in the mountain provinces it might prove to be of importance in the dissemination of malaria in those regions.

"*Anopheles sinensis*, has a low, if not negative susceptibility. It appears from the literature, as well as from our own observations, to be extremely localised in its geographical distribution in the Philippines; it is scarce, and is a relatively "wild" species. Therefore, while the few experiments made with it showed this species to have a relatively high avidity for human blood, it is probable that its part in the transmission of malaria in the Philippines is negligible.

"*Anopheles barbirostris* stands the lowest in our experiments in its avidity for human blood and it is a relatively "wild" species. It appears to have a wide but scattered distribution in the Philippines, and its susceptibility to infection with malarial parasites is rather feeble. On the whole, it is probable that this species plays a subordinate part in the spread of malaria in these Islands.

"*Anopheles rossii* is one of the most domestic of the anophelines, with a relatively high avidity for human blood. It is very widely distributed, especially along the coast and lowlands, and is relatively prevalent. Its susceptibility to infection with the malarial parasite is rather low. It is possible that this species may play a certain rôle in the dissemination of malaria, especially along the extensive coasts of this Archipelago.

"*Anopheles febrifer* is both a "wild" and also a domestic species in so far as shaded breeding places are afforded, with a relatively high avidity for human blood. It is by far the most susceptible among the 5 species investigated, and is probably the most susceptible species in the Philippines. If investigations, which are now being carried on by one of us (Barber), prove it to be as widely distributed throughout the Archipelago as it is in Laguna Province, *Anopheles febrifer* is the most important mosquito concerned in the epidemiology of malaria in the Philippine Islands."

[This valuable paper embodies the results of a long, careful and troublesome piece of research and will serve as a very useful guide for those who wish to carry out work on similar lines elsewhere. In a review of this kind it is not possible to do full justice to it and the original should be consulted by all workers on the experimental transmission of malaria by anophelines.]

A. Balfour.

Stanton (A. T.). **Anopheles and Malaria in the Oriental Region.**— *Far East Assoc. Trop. Med. C. R. Trois. Congrès Biennal. Saigon.* (1913). 1914. pp. 514-519.

In this useful paper Stanton, following the example set by Knab in America, endeavours to bring order out of chaos as regards the nomenclature of the anophelines belonging to the Oriental Region. He also furnishes information as to which species have been definitely proved to be malaria carriers. In the first place he considers the

35 species found in the Malay Peninsula, and in the following tables indicates the valid species, the synonyms and the errors which have been made in identification :—

I.—Valid Species.

aitkeni, James.	*ludlowi*, Theobald.
albirostris, Theobald.	*maculatus*, Theobald.
albotaeniatus, Theobald.	*nigrans*, Stanton.
aurirostris, Watson.	*rossi*, Giles.
asiaticus, Leicester.	*tessalatus*, Theobald.
barbirostris, Van der Wulp	*umbrosus*, Theobald.
fuliginosus, Giles.	*watsoni*, Leicester.
kochi, Dönitz.	*wellingtonianus*, Alcock.
leucosphyrus, Dönitz.	

II.—Synonyms.

annularis, Van der Wulp	=	*sinensis*, Wiedmann.
elegans, James	=	*leucosphyrus*, Dönitz.
fragilis, Theobald	=	*aitkeni*, James.
halli, James	=	*kochi*, Dönitz.
karwari, James	=	*nigrans*, Stanton.
leucophyrus, Leicester	=	*leucosphyrus*, Dönitz.
minutus, Theobald	=	*sinensis*, Wiedemann.
nivipes, Theobald	=	*fuliginosus*, Giles.
ocellatus, Theobald	=	*kochi*, Dönitz.
peditaeniatus, Leicester	=	*sinensis*, Wiedemann.
separatus, Leicester	=	*sinensis*, Wiedemann.
treacherii, Leicester	=	*aitkeni*, James.
vanus, Walker	=	*sinensis*, Wiedemann.

III.—Errors in Identification.

listoni, Liston	for	*albirostris*, Theobald.
punctulatus, Dönitz	for	*tessalatus*, Theobald.
Willmori, James	for	*maculatus*, Theobald.

[*A. sinensis* seems to have been omitted from the list of valid species.]

It appears that the anopheline fauna of Sumatra and Java were described separately by Professor Doenitz about the same time that Theobald was dealing with those of Malaya. English speaking workers followed the latter's nomenclature and hence confusion has arisen, as in many cases Professor Doenitz's descriptions were published first.

In the second place, Stanton examines and reports upon the records of malaria infection in anopheles. His statements may with convenience be tabulated :—

Observer.	*Country.*	*Species.*
James	India	*culicifacies*, Giles. *fuliginosus*, Giles. *listoni*, Liston. *maculipalpis*, James & Liston. *stephensi*, Liston.
Christophers	Andaman Islands	*ludlowi*, Theobald.
Schueffner and De Vogel	Sumatra	*rossi*, Giles.
Miyajima and Kinoshita	Formosa	*listoni*, Liston. *annulipes*, *sinensis*, Wiedemann. *formosaensis*
Leicester, James and Stanton	Federated Malay States	*maculatus*, Theobald. *nigrans*, Stanton. *umbrosus*. *fuliginosus*, Giles. *albirostris*, Theobald. *sinensis*, Wiedemann.

A consideration of the *listoni*, *Nyssorhynchus* and *rossi* groups follows. There has been much argument about the last named, and further evidence is required from Drs. SCHUEFFNER and DE VOGEL who are chiefly responsible for incriminating *rossi* as a malaria carrier.

Stanton mentions those anophelines which he has examined with negative results and concludes by stating that, so far as malignant malaria is concerned, the small brown species, i.e. *listoni*, *culicifacies* and *albirostris* are chiefly to blame in the Oriental region.

Next comes the *Nyssorhynchus* group, comprising *maculatus*, *fuliginosus* and *stephensi*.

The part played by *ludlowi*, *sinensis* and *umbrosus* is not so clear and seems to merit further research.

A. B.

BASS (C. C.). **A Discussion of Malaria Carriers and the Important Rôle they play in the Persistence and Spread of Malaria.**—*Southern Med. Jl.* 1915. Mar. Vol. 8. No. 3. pp. 182–184.

Bass reminds his readers that people actually suffering from malaria are quite a minor factor in the spread of that disease. He goes on to say that persons who are not ill and have not been ill of malaria are the chief malaria carriers, though it is also true that persons who have recovered from an attack of malaria frequently remain carriers for many months or perhaps years.

He mentions rather a remarkable case where "in one instance, by centrifuging the defibrinated blood drawn from a patient we were able to collect a measurable quantity of pure crescents free from blood cells (except those attached to the individual crescents). The quantity obtained was approximately 1-160th of the quantity of blood from which they were recovered, or one c.c. from one hundred and sixty c.c. At this rate the entire blood of an average sized man would contain about thirty-five c.c. of pure crescents. In spite of this large number of crescents, the patient was up and about the ward and anxious to be discharged. He had not had fever since eight days previously. Asexual plasmodia were demonstrable during the attack of fever."

It is also worth while quoting another statement which runs as follows :—

"If we estimate the amount of malaria plasmodia in some of these cases we must conclude that it is comparatively a non-toxic organism after all. A case that recently came to my attention had an average of one parasite to every two and one-fourth red cell in his peripheral circulation. Assuming that the volume of each mature schizont is as great as that of a red blood cell (and it is actually considerably greater), this patient would have had by the end of forty-eight hours approximately three pints of malaria plasmodia. As a result of prompt quinine treatment he was living at the end of forty-eight hours with fair prospect of recovery, and had only an occasional sickly-looking parasite in his peripheral blood. I have known several cases to recover when every fifth to tenth red blood cell contained parasites, and there was as much as from half a pint to a pint of plasmodia produced every forty-eight hours."

The mechanism of malaria immunity is briefly considered, as is the influence of insufficient quinine treatment in producing gametes and hence carriers. "It is often found," says Bass, "that there are three to five or more times as many people who have plasmodia in their blood, in a community, as there are who are ill or have been ill with malaria. The carriers are not sick and will not get sick unless special

conditions favouring development of malaria plasmodia in them should arise." In other words these persons have become infected and the infection has gone on to gamete formation without any clinical symptoms having shown themselves.

[While no one will deny the importance of carriers, it is at least open to question if the author's statement, that persons *who have never been ill of malaria* are the chief carriers, is correct. In the past the experience appears to have been that chronic malarics who have had one or more attacks of acute malaria, who harbour gametes in abundance, and who are anaemic or suffering from the effects of the disease, constitute the most dangerous carriers. In the light of Bass's statements it would seem that further research upon this point is very necessary.]

A. B.

Jamieson (Sydney). **Malaria arising in a Non-Malarial District.**—*Med. Jl. of Australia.* 1915. Feb. 20. Vol. 1. 2nd year. No. 8. pp. 163–168. With 1 fig.

An account of a case of simple tertian malaria occurring in the person of a scrub-cleaner and cutter in a district of New South Wales. Although anophelines are known to be present in this part of Australia there is no evidence of previous locally acquired malaria there. The author, although he does not indicate how infection was acquired in the case he describes, points out the danger to which the population of New South Wales is exposed at the present time when a considerable number of malaria-infected soldiers is returning from New Guinea.

A. B.

Spencer (H. A.). **Malaria and Malarial Affections.**—*Med. Jl. of S. Africa.* 1915. Jan. Vol. 10. No. 6. pp. 107–110.

In this paper the author suggests the possibility of malaria occurring in Pretoria, and explodes erroneous ideas as to the part which altitude *per se* has been supposed to play. He then shows how rarely typical cases of malaria are encountered at Middelburg in the Transvaal. Rigors occur in less than half the cases coming under notice and in his experience two of the most suspicious symptoms are bronchial catarrh and "bone-pains." The former is often associated with a cough coming on periodically at night. The latter occur chiefly in the tibiae or in the head or shaft of the femur, or of the humerus, *i.e.* the bones where marrow cavities are most common. Spencer thinks the pains are due to an infection of the bone marrow, which forms a favourite and suitable nidus for the growth of the parasite. Both these conditions rapidly clear up under quinine treatment.

[The author seems to rely too much upon the therapeutic test, which is frequently fallacious. He speaks of the difficulty of taking smears from children. Those taken often showed no parasites, sometimes only masses of pigment. He does not seem to have carried out differential leucocyte counts and this rather detracts from the value of his interesting observations.]

Amongst these there is an account of facial and frontal neuralgia complicated by an occipital headache, a symptom he associates with malaria, and he gives a record of other difficult cases.

He thinks the catarrhal conditions, which may also affect the alimentary tract, are due to the mucous membranes being concerned, like the skin, in the separation of malarial toxins from the blood. Thus liquid stools are common in the course of severe and intractable malaria while this, he says, explains further the abdominal pain and tenderness not infrequently encountered in the remittent variety, causing it to be mistaken for enteric fever.

A. B.

Willets (David G.). **Malaria in the Philippine General Hospital, Manila, P. I., during the Fiscal Year 1913.**—*Philippine Jl. of Sci.* Sect. B. Trop. Med. 1914. Sept. Vol. 9. No. 5. pp. 441–452.

There is nothing new in this paper, which is a careful analysis of 348 cases of malaria treated in the General Hospital, Manila, in 1913.

Total leucocyte counts are recorded [differential counts are not mentioned], faecal findings and the results of urine analysis are given, and the splenic index is stated. It is instructive to note that albumin, either alone or along with red cells, pus corpuscles or casts, was present in 118 cases although genito-urinary disorders may have been accountable for these results in certain instances.

Although the paper has a certain statistical value it possesses more local than general interest.

A. B.

Solomons (Bethel). **A Note on Malaria as a Complication of the Puerperium.**—*Med. Press. & Circ.* 1915. Mar. 3. New Ser. Vol. 99. No. 3956. pp. 213–214.

This is a paper by a gynaecologist who had his first experience of malaria when attending in Dublin the wife of an officer of the Indian army. She was a primigravida, and the case proved to be one of impacted breech. Some local damage was done at the time of delivery but there was no *post-partum* haemorrhage.

After the birth of the child the temperature rose and kept up and the pulse became rapid and continued so. Both records are given, the highest temperature, 102·2°, being reached on the fourth evening. Bacteriological examinations of smears from the uterus were negative.

It was not until the fifteenth day that the malarial parasite [species not stated] was found. A bacteriological blood culture made at this time gave negative results. When the patient was properly treated with quinine she soon recovered. Solomons mentions that the patient had never told him that she had suffered from malaria. It was only later that she admitted having had an attack two years previously. Naturally septic infection was at first supposed to be the cause of all the trouble [See the record by Seifert of a very similar case in this *Bulletin*, Vol. 5, p. 244.]

The temperature curve was hectic in type and there was no hepatic or splenic enlargement, no nausea or sickness. The chart seemed to indicate a double tertian.

The author says that malaria complicating the puerperium is a very rare condition. He found it ignored in some standard text books of tropical medicine and could only obtain four papers in the literature and reference to nine others which were not available in Dublin

[It would seem that the author did not consult this *Bulletin*, for there he would have found records of cases, some resembling that which he has described. His paper is useful in again directing attention to the protean nature of malaria, and its great importance as a complication in traumatic and other conditions.]

A. B.

WRIGHT (Thos. E.), **Thirty Cases of Malaria, Estivo-Autumnal, treated with Quinine intravenously.** –*Southern Med. Jl.* 1915. Mar. Vol. 8. No. 3. pp. 196–201. With 1 fig.

As the result of treating 30 cases of *P. falciparum* infection by intravenous injections of quinine hydrochloride in proper dilution the author concludes that :

" 1. The intravenous use of quinine in doses of 15 grains in a dilution of 250 to 300 c.c. of saline in the hands of a careful, competent physician is safe.

" 2. The discomfort to the patient is so slight it becomes a matter of small importance, and in this respect when compared with quinine by mouth or hypodermic is much to be preferred.

" 3. The number of doses for the different types of malaria, the proper time to elapse between their administration, the exact dosage and dilution necessary and safe, the permanency of the relief of symptoms, are problems that will be worked out.

" 4. The relief from the symptoms in malaria, so often jeopardizing life, may be obtained very promptly, safely and constantly by this method."

Where possible, and in order to avoid reactions the quinine should be dissolved in water which is *freshly* distilled as well as sterile.

The largest number of infusions given to any one case was three, most of the patients getting one or two. Three cases had a relapse, and the author thinks that it is possible that some of the others may also relapse.

A. B.

BEARD (J.); BALFOUR (Andrew). **The Pancreatic Treatment of Relapse Malaria.** [Correspondence].—*Brit. Med. Jl.* 1915. Mar. 6. pp. 449–450; Mar. 20. p. 528.

Beard finds fault with the War Office for not giving his pancreatic treatment of relapse malaria due consideration. His use of trypsin and amylopsin is based upon the view that the organism of malaria cannot live in the presence of these higher ferments, and he cites the results of Major LAMBELLE's investigations as proof of the value of his method [this *Bulletin*, Vol. 3, p. 148.] According to him the treatment is scientific, rapid in action, cheap and highly efficacious.

Balfour, in reply to this letter, points out that Beard appears to have overlooked a paper by FRETZ [see page 362] who treated 19 cases of malaria by injections of amylopsin and trypsin, but had by no means such good results as LAMBELLE. In some cases indeed the treatment appeared to be rather a useless and painful operation, although FRETZ says that his method of administration may possibly have been faulty.

Balfour thinks that, while the method deserves a proper trial, it cannot at this stage be considered " highly efficacious."

A. B.

Barlow (Nathan). **Clinical Report of the Anti-Malarial Campaign at Guyamel.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. Mar. Vol. 2. No. 9. pp. 585–596.

Cuyamel is in Honduras and the plantation of the Cuyamel Fruit Company lies between the coast and the foothills, covers a strip of land over 30 miles long and of variable width, and was intensely malarious. All three types of malaria occurred and every form of malignant malaria was frequently encountered. All methods of preventing human infection were impracticable and so the plan was adopted of preventing infection of the mosquitoes. A record of experiments at the end of the paper show how the data on which this attempt was made were obtained. The facts elicited were :—

"First: *Plasmodium falciparum* does not produce gametocytes in sufficient numbers to be evident in the circulating blood, until at least two or three weeks after clinical symptoms have been manifest. *P. malariae* and *P. vivax*, on the contrary, often have many gametocytes in a specimen taken during the first chill. Second: contrary to the usual statement, the administration of quinine does not cause the appearance of gametocytes at an earlier date, nor does it cause an increase in their number. It is perfectly true that the proportion of gametocytes to other forms is increased under quinine; but this is due to the persistence of the already formed gametocytes and to the fact that the action of quinine does not prevent the development to maturity of the gametocytes, but does destroy the vegetative forms at an earlier date."

It is therefore clear that, in any locality where the prevalent infection is with *P. falciparum*, the discovery of every case in the first week of illness, combined with such thorough treatment that relapse and latency do not result, must lead after some months to an elimination of infected mosquitoes from that locality. The outlook is by no means so favourable in the case of the other two plasmodia, for the discovery must be much more prompt for the efforts made to accomplish any results.

The campaign conducted by Barlow, for a time single-handed and then with one assistant, produced very remarkable results, as will be evident from the table :

	P. falciparum.	*P. vivax.*	*P. malariae.*
Jan. 26th to May 2nd—			
Pure	929	24	4
Mixed	71	61	13
Clinical	800	–	–
June 20th to Oct. 1st—			
Pure	102	43	2
Mixed	5	2	3
Oct. 1st to Oct. 31st—			
Pure	6	0	3

He states that of the six cases of falciparum infection found in October only one originated on the plantation and that "If such results can be obtained among an ignorant, illiterate, nomadic population, in the midst of a tropical jungle, with near-by settlements heavily infected with malaria, it would seem that in an enlightened community, with a stationary population, more or less screening of dwellings, and with at least the amount of mosquito eradication which is produced by the drainage and cultivation of land, that a cooperative effort by physicians to promptly diagnose every case of malaria, and to energetically instruct and reinstruct every patient in the

necessity of a sufficiently long course of treatment, to insure against relapse or latency, ought to result in the complete eradication of at last the aestivo-autumnal form of malaria."

Notes on relapse follow in the course of which the author details the plan he has followed for its prevention. Cases of malaria are treated as follows:

"Preliminary laxative, usually calomel, to be followed by a small dose of magnesium sulphate.
"Twenty to thirty grains of quinine bisulphate for two days.
"Fifteen grains daily, for one month.
"Fifteen grains twice a week for two additional months, in cases of aestivo-autumnal infection.
"Rest and light diet during the continuance of the symptoms."

If the quinine therapy proves disagreeable it is combined with sodium bromide, but very few cases have been found in which tolerance was not readily established.

Alcohol is strongly contra-indicated. It accentuates nervous irritability and much smaller quantities of alcohol produce an excited intoxication than the amount required to do so under normal conditions.

Iron and other tonics are only given to those cases which seem to call for it specially. In cerebral cases and those in which severe vomiting precludes oral administration, from 15 to 25 grains of a soluble quinine salt with an equal quantity of sodium bromide and enough sodium chloride to make the solution approximately isotonic are given intravenously in at least 600 c.c. of freshly distilled water. As a rule after one such dose the drug could be taken by the mouth on the succeeding day.

Where intravenous injection was not feasible the intramuscular method was employed but modified in the direction of giving a number of injections in different localities, not more than 3 grains of quinine being given in any one place. This, according to Barlow, led to much greater rapidity and certainty of action. No local trouble resulted in five cases thus treated and kept under observation for six months. On the other hand, dispensary cases have been seen suffering from induration and abscess after intramuscular injection of massive doses. In all these cases the trouble did not arise till after the patients had ceased to be under medical control. The author suggests that the prolonged anaesthetic effect of the quinine prevented the early recognition of the local damage. [He says nothing about possible septicity as a cause.]

The following table shows the results of treatment as regards the occurrence of relapses:

Duration of Treatment.	*Patients.*	*Relapses.*
Less than one month	116	116
One month	246	91 (37 %)
Three months	218	0

The results obtained in this campaign are, within limits, so remarkable and significant that it seems advisable to give the author's conclusions in full, and it is evident that his method should be carefully followed elsewhere and the results duly recorded. He says:

"Quinin in therapeutic doses does not act upon the plasmodium; but upon the red blood cell. It so poisons the cell that it is more susceptible to the action of the proteolytic ferments of the plasmodium, resulting

in a premature liberation and destruction of the forms belonging to the cycle of schizogony. This effect persists after the elimination of the quinin, and is lost only by the replacing of the red cells by new-formed ones.

"There is no time particularly favorable for the administration of quinin. It should be given as soon as possible after the diagnosis of malaria is made.

"Moderate doses of quinin accomplish as much as large ones.

"Quinin does not hasten the appearance of the gametocytes, nor increase, even temporarily, their actual numbers.

"The length of time of treatment required to remove *P. falciparum* from the blood is proportioned directly to the duration of the infection; that is, to the age of the brood of parasites. In a very recent infection it is more easily caused to disappear from the circulation than either of the other plasmodia. One of the chief sources of error in diagnosis is the fact that a few irregular doses of quinin may so suppress this form in the circulating blood, that a number of examinations are necessary to find it. On the other hand, a long-standing infection may require months of most careful treatment to remove the parasites from the blood.

"The gametocytes of *P. vivax* and *P. malariae* appear very early in the course of the infection. The gametocytes of *P. falciparum* are not usually evident in the circulation until from three to five weeks after clinical symptoms have been manifest.

"Nothing less than three months of systematic treatment can prevent a satisfactory proportion of the cases of aestivo-autumnal malaria from relapsing.

"In any community, the prompt diagnosis and thorough treatment of every case of the infection with *Plasmodium falciparum* will result, after a few months, in there being no infected mosquitoes in that locality.

"If the immigration of new cases be not too great, it is possible, by this means alone, to eradicate aestivo-autumnal malaria from a given district, even without the aid of mosquito destruction, screening, or systematic quinin prophylaxis."

[Of course in the tropics it is only under special conditions that a systematic quinine therapy of this kind can be carried out, but it should be feasible upon estates, plantations, in military cantonments and other places where the patients are under medical supervision and control. It requires much alertness and patience on the part of the physician, but the results would certainly seem to justify the time and energy expended upon it.]

A. B.

Le Prince (J. A. A.). **Malaria Control. Drainage as an Antimalarial Measure.**—*U. S. Public Health Rep.* 1915. Feb. 19. Vol. 30. No. 8. pp. 536–545. With 13 figs.

A special type of drainage is required for mosquito control and eradication which, while ensuring drainage of the land, will not provide breeding places. The author discusses his subject under the following heads:—

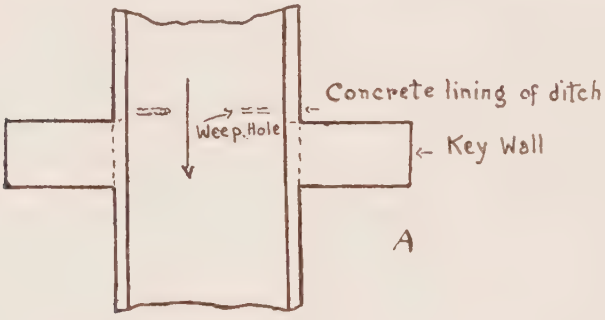
1. Training natural streams and water courses.
2. Open ditches and intercepting ditches.
3. The installation of permanent lining in ditches.
4. Subsurface drains.
5. Filling.
6. Proper maintenance.

A stream should have steep banks directly above and below the flow line, uniform grade and width, a straight course and be free from grass, sticks, stones, and other obstructions to the current. Directions

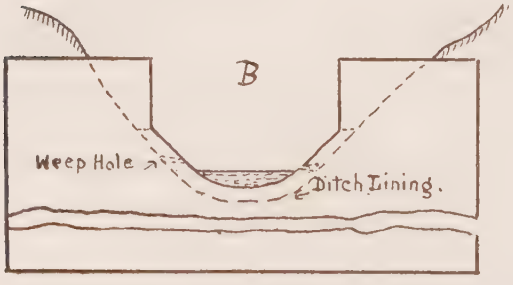
are given to show how one may deal with streams to make them approximate to this ideal. It is chiefly a question of proper regrading.

There should be as few ditches as possible and they should have clean-cut, sloping edges, narrow bottoms and straight courses. Sharp bends should be avoided and branch ditches should join main ditches at an acute angle or curve. In average soils the slope of the sides of the ditches should be about 45° but is flatter in sand and soft mud. The author gives other common-sense details which are apt to be forgotten in practice.

It is often cheaper to line ditches or parts of ditches with concrete than to be repeatedly regrading, cleaning and oiling them. Stone with cement, mortar, lumber or concrete may be used. For small ditches the lining need only come up to 3 inches above the normal water line. It need not have a smooth or fancy finish which adds to the cost. To prevent side scour above the lining, especially at curves and bends, the outer wall lining may be raised or the ditch may be widened or key walls installed. The latter will also prevent side scour and under scour of linings of straight ditches of heavy grades. Weep or seepage holes are required above the key wall. They should slope towards the centre or bottom of the ditch. They are intended to deal with water behind the lining and should be made in the side walls before the concrete has set. Linings should be U-shaped with sloping sides. (Figs. A and B.)



A.—Plan of key wall.



B.—Cross section of key wall.

Information is given as regards subsoil drainage by means of drain tiles both for the purpose of lowering the water table and for the interception of seepage. A different principle is followed in each case, as is explained by the author with the aid of simple diagrams. He states:—"The advantage of subsurface drain, as compared to

the open ditches, is that it is self-cleaning, maintains itself, permits of rapid inspection, needs very little attention, requires no oiling and permits of no exposure of water accessible to mosquitoes."

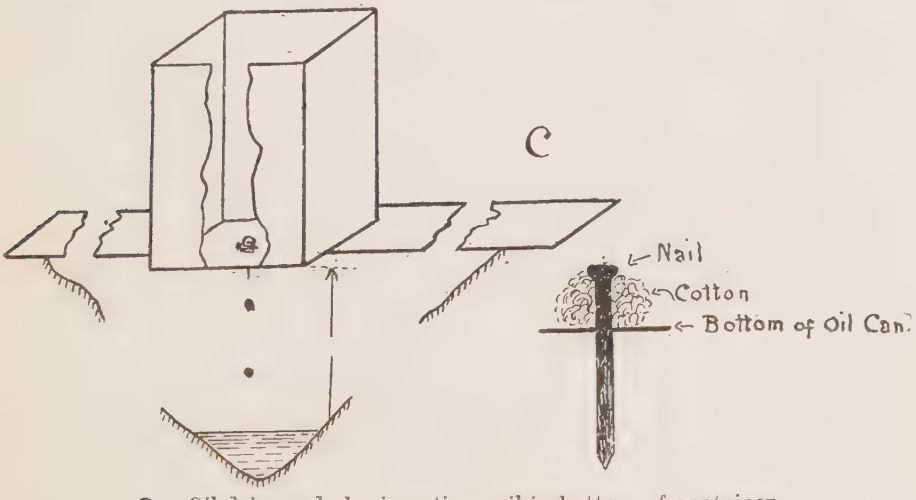
The section on filling for water collections and that on maintenance of ditches scarcely require a summary here. Cinders are very good for filling ground. The use of copper sulphate for destroying algae is mentioned and there are notes as to the type of inspector required and the nature and conduct of his work, the outcome of Le Prince's large experience in the Panama Canal zone.

A. B.

Le Prince (J. A. A.). **Control of Malaria. Oiling as an Antimosquito Measure.**—*U. S. Public Health Rep.* Feb. 26, 1915. Vol. 30. No. 9. pp. 599–608. With 5 figs.

After some remarks on the type of oil which may be used, remarks which contain nothing new, Le Prince considers the question of where oiling is applicable. Here again there is not much to note, though in view of the fact that the question of how much oil should be used is frequently asked, the author's statement may be quoted. He says :—

"It is not practicable to state how much oil should be used per unit of area. The density and spreading qualities of different shipments of commercial oils, and even of oil from the top and bottom of the same barrel, may vary so much as to upset all calculations. All oils spread better in warm weather. Just sufficient oil should be used to form a complete film. Laborers sometimes have difficulty in seeing where a film of kerosene is present on water, but can soon be so trained in the use of other oils as not to apply more oil than is necessary."

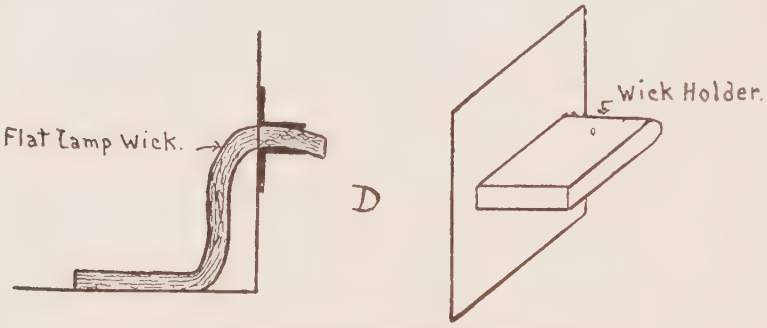


C.—Oil drip made by inserting nail in bottom of container.

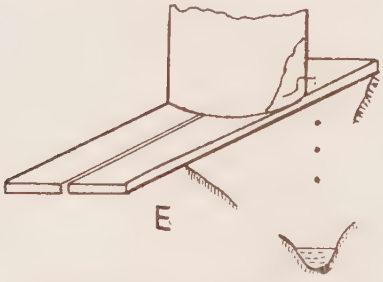
Methods of oiling are then considered, the use of the watering-pot, the knapsack sprayers, spraying machine as used in boats, oil drips, and oil soaked cotton waste being discussed.

The account of the oil drips is useful and practical. A cheap and simple form is shown in the diagram (Fig. C). By pulling the point of the nail downwards and gently pushing it upwards the flow of oil may be decreased or increased as desired.

For thinner oils a 5-gallon can with metal discharge tap may be used, while for the heavy crude oil of asphalt base largely used at Panama, a flat lamp-wick drip was employed in a holder which was compressed or widened as the rate of flow was altered. (Figs. D and E.)



D.—Detail of drip used for heavy oils.



E.—Oil drip for heavy oils.

On ditches or streams having an average width of water surface of 1 foot from 10 to 20 drops of oil per minute are applied. The quantity of oil needed varies, of course, with the local conditions. On long streams or ditches several drip cans may be necessary.

Where the quantity of moving water is too small to warrant the use of a drip-can, a small bundle of oil-soaked cotton waste is placed at the source of the water. A thin film of oil will exude from it for about a week. It can then be re-soaked in oil and used again, the heavier oils being the best for this purpose.

Notes on personnel, inspections and working maps and records conclude a useful, practical paper.

A. B.

Le Prince (J. A. A.). **Impounded Waters. A Study of Such Waters on the Coosa River in Shelby, Chilton, Talladega, and Coosa Counties, Ala., to determine the Extent to which they affect the Production of Anophelines, and of the Particular Conditions which increase or decrease their Propagation.**—*U. S. Public Health Rep.* 1915 Feb. 12. Vol. 30. No. 7. pp. 473–481. With 2 sketch maps.

The survey of these impounded waters, where *Anopheles quadrimaculatus* and *A. punctipennis* breed, was made during the late autumn

and the author states that conditions during late spring and mid-summer may be entirely different. Naturally the findings possess chiefly a local interest, but it is worth noting that in the lake itself collections of pine needles constituted the most important factor for the production of anopheles larvae. Over 90 per cent. of the larvae and pupae taken were got by dipping among such collections, and it did not matter whether they were near the shore or 2 or 10 feet off it.

The relative importance of places where larvae were found in the lake was in the following order :—

1. Groups of pine needles (when not too closely compact).
2. Débris, consisting of bark, leaves and twigs.
3. Long grass lying on the water surface (only noted at Cedar Creek).
4. Dead leaves of trees floating on the surface (present from September to November).
5. Logs, branches, stumps, etc.

A note indicates that *Anopheles crucians* was present in addition to the other two species, possibly, however, only as adult mosquitoes.

There was a paucity of top-feeding minnows in the lake. Where they did occur anophelines were either very scarce or absent.

Trees left standing in water, if not close together, are not so important in assisting anopheline propagation as are brush, tall grass and saplings.

A plan show the local conditions, but scarcely requires reproduction here.

A. B.

Bass (C. C.). **Report of the Malaria Commission of Southern Medical Association.**—*Southern Med. Jl.* 1915. Mar. Vol. 8. No. 3. p. 201.

Members of the Commission have published about 50 papers during the year, and 25 public addresses have been delivered. A short treatise on malaria is being prepared, dealing with diagnosis and treatment, and this is to be distributed to all physicians in the malaria section.

A. B.

Stephens (J. W. W.). **On the Peculiar Morphological Appearances of a Malaria Parasite.**—*Ann. Trop. Med. & Parasit.* 1915. Mar. 18. Vol. 9. No. 1. pp. 169–172. With 1 plate.

The author describes and illustrates by an excellent plate a peculiar malaria parasite found in a blood slide sent him by Dr. Le Fanu from the Gold Coast. The latter thought that the forms seen were similar to the author's *P. tenue* [see this *Bulletin*, Vol. 3, p. 432].

The film was made from the blood of a native child that came for treatment, and the infection is not a severe one, while the blood cells present no evidence whatever of stretching or distortion, and the peculiar looking parasites occur alike in the thick and thin parts of the film.

In addition, large and apparently quite normal quartan parasites occur, and it is possible to trace a transition from normal ring forms to those in which chromatin particles or strands without any protoplasm are seen in the red cells. Stephens thinks that these forms may be explained in three ways :—

(1) That they are a new species of parasite.

(2) That they are degenerative, i.e., formed in the body under unknown conditions, and so perhaps analogous to the so-called quinine forms of parasites.

(3) That they are artificial, i.e., formed outside the body under unknown conditions.

He considers that the forms showing only chromatin speak in favour of (2) or (3) rather than of the first hypothesis. On the other hand, the presence of normal quartan parasites is against the two latter views. Forms without chromatin were not seen and pigment grains apart from parasites were not encountered in the red cells.

The author thinks that when evidence is forthcoming as to the true nature of these forms light will be thrown upon the question of the validity or otherwise of *P. tenue*. He discusses briefly the remarks of Balfour and Wenyon, and Craig on this subject [see this *Bulletin*, Vol. 5, pp. 53 and 250], and states that an examination of further films from the case of *P. tenue* revealed the presence of quartan parasites and in addition in one film a single pigmented (presumably simple tertian) parasite in an enlarged cell showing Schüffner's dots.

A. B.

i. Van Dine (D. L.). **The Losses to Rural Industries through Mosquitos that convey Malaria.**—*Southern Med. Jl.* 1915. Mar. Vol. 8. No. 3. pp. 184–194. With 2 figs.

ii. Thibault, Jr. (James K.). **A Comparative Study on the Losses to Rural Industries from Malarial Mosquitos.**—*Ibid.* pp. 195–196.

i. The United States Bureau of Entomology selected a plantation in the Southern States for the purpose of making a special and intensive study of malaria on the lines indicated by the title of this paper. It was necessary to choose a locality where such conflicting factors as ankylostomiasis, enteric fever and pellagra were absent, where the soil was highly productive and where the estate was efficiently managed on progressive lines. Such a spot was found in the Delta region of the Mississipi Valley.

The environment and the nature of the soil are described. Negro tenant farmers far outnumbered all other classes on the plantation, and a table shows that there were 74 families with a total of 299 individuals. Males over 18 years of age were considered to work full adult time and calculations are given for females, youths and boys above eight.

A second table shows that from May 1st to October 15th, 1914, this population lost 625·5 working days owing to cases of malaria reported to the doctor. In addition there was a loss of 250·75 days of adult time amongst persons not treated (doubtful cases not included), and a yet further loss of 235·5 days owing to the necessity of workers attending upon the sick in their households.

Thus, during the crop season a total loss of 1,066 days of adult time occurred. [It would seem that the figure should really be 1,111·75 days.]

Other tables follow. An effort was made to estimate the reduction in the yield of corn owing to the loss of working days, but this has not yet been possible. At the same time, the results as regards loss of time are regarded as significant. *Anopheles quadrimaculatus* was the mosquito at fault, and it was found to be partially domestic in its habits. Some notes on its biology complete a paper which is rather out of the common and may be studied by hygienists with advantage.

ii. A somewhat similar investigation on a smaller scale was carried out at Scott, Arkansas, where it was found that patients lost an average of 5·50 days for each attack. Taking also into account an average loss of three days for nursing in the case of each attack, a family lost 8·50 days for every case of malaria.

A. B.

BLACKWATER FEVER.

Stephens (J. W. W.) & Stott (W.). **Studies in Blackwater Fever. III.—The Relationship of Quinine to Blackwater Fever.**—*Ann. Trop. Med. & Parasit.* 1915. Mar. 18. Vol. 9, No. 1. pp. 201–212. With 2 charts & 1 fig.

This paper embodies the results of a statistical examination of the respective times at which quinine is given and blackwater occurs, which was undertaken in order to see what the relationship actually is between the two.

The records were found incomplete. Indeed it was practically impossible to get those which gave a complete quinine history, so the authors were driven to examine as to what relationship existed between the time of the blackwater and that of the *last dose* of quinine. Some of the records gave the onset of the rigor, others the time when the blackwater began. The first is perhaps the more accurate indication of the commencement of the attack, although we do not know how long haemoglobinous urine can be retained. It seems, however, to be generally assumed that such urine is irritating to the bladder.

The three important dates (time of last dose of quinine, of onset of rigor and of first passage of blackwater) were obtained in whole or in part in 372 cases. By the help of tables, charts and diagrams illustrating correlation or fits, the authors explain very carefully the methods they adopted in the research and demonstrate the results obtained.

The charts are reproduced here,* but the original paper must be consulted for the statistical details. By "mode" (*vide* the chart inscriptions) is meant the most usual time.

The authors started with the assumption that the taking of quinine by persons with a certain diathesis is the cause or a cause of blackwater. Acting on this they expected to and did discover a positive correlation between the time of taking quinine and the symptoms of the illness. They also found, as they expected, that this correlation was brought nearer to unity as the figures for the effect were brought more in coincidence with the cause, i.e. as the two "modes" were brought together.

They advance the following possible explanations of this correlation :–

"(1) It is purely accidental, due to the fact that blackwater has a 'natural' mode in the 9 a.m.–12 noon interval. This, as we have said, could be eliminated by seeing whether the same mode existed when quinine was taken at other times than 6–9 a.m. For this purpose we require further cases with the times accurately recorded.

"(2) The correlation is produced by some unknown cause or causes which determine both the fact that the mode of quinine is at 6–9 a.m., and that the mode of the rigors is at 9 a.m.–12 noon. We cannot suggest any such cause.

"(3) The correlation is one of *cause and effect.*

"We believe, then, that, provided (2) can be excluded, that an examination of further cases, in the way we have done here, will decide whether (1) or (3) is the true answer to the question."

It is admitted that the cases are neither sufficiently numerous, nor recorded with sufficient accuracy of detail to warrant a definite conclusion, but the authors believe their work and results indicate how the problem should be attacked in the future, and they comment upon the great importance of such an investigation. A. Balfour.

* By permission of Professor Stephens.

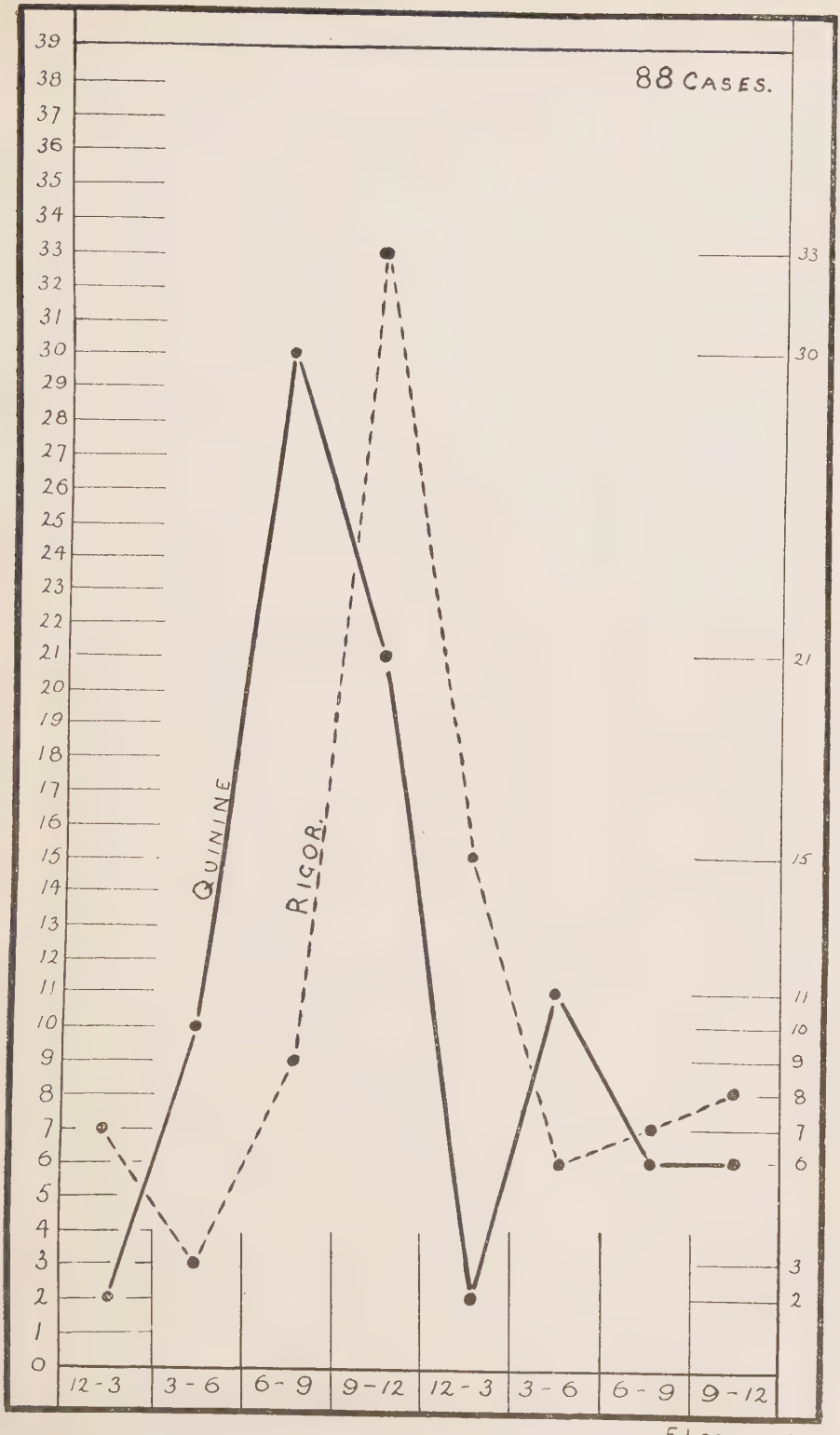


CHART I.—Showing the relationship of quinine and rigor in 88 cases. The mode of quinine is at 6-9 a.m., that of the rigors is at 9 a.m.–12 noon.

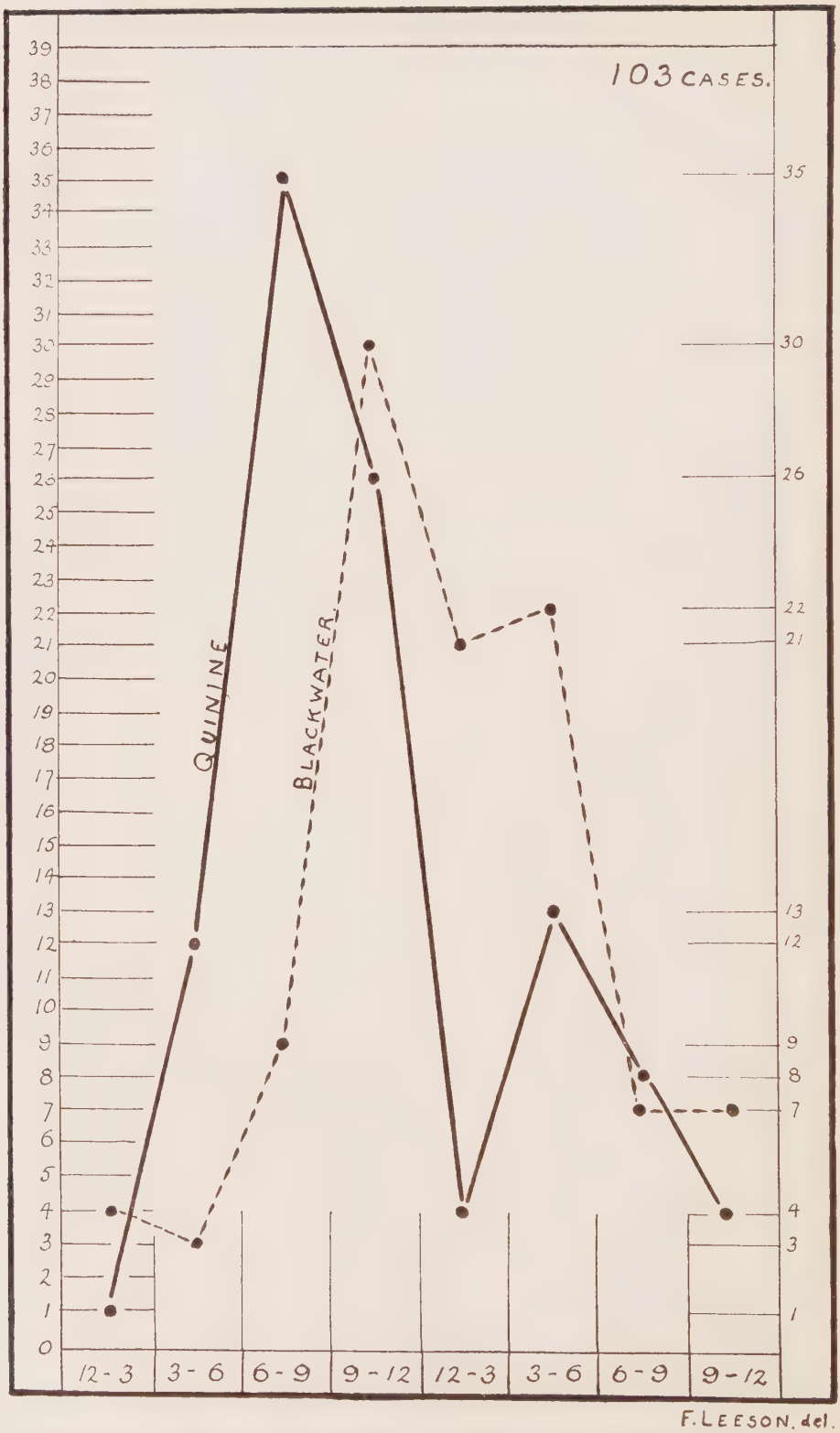


CHART II.—Showing the relationship of quinine and blackwater in 103 cases. The mode of quinine is at 6–9 a.m., that of blackwater is at 9 a.m.–12 noon.

FEDERATED MALAY STATES. **Thirteenth Annual Report of the Institute for Medical Research, Kuala Lumpur, Federated Malay States, 1913.** [FRASER (Henry), M.D., Director], 1914. Kuala Lumpur: Printed at the F. M. S. Government Printing Office. [Report on Blackwater Fever by FLETCHER (W.), pp. 31–52].

Dr. Fletcher records the occurrence of eighteen cases of blackwater fever during the year. When possible the cases were visited and the urine and blood examined.

Eight of the patients were Europeans, six were Indians, three Chinese and one Japanese. All had suffered from malaria and most of them came from notoriously malarious districts. Quinine did not seem to be specially associated with the onset of the attacks. All the cases except two which ended fatally were treated with quinine during the attack. Of three cases treated with small doses one died. Two received 15 grains a day and both recovered. Eleven were given 20 grains or more every 24 hours and of these nine got better. Although there is no evidence that quinine cut short the disease, it did not prolong it.

As regards the presence of malaria parasites, in four cases in which the blood was examined less than 24 hours before the attack, subtertian parasites were found in every instance. In one very mild case crescents and simple tertian parasites persisted in the blood throughout the attack of blackwater fever. In the other cases the parasite vanished soon after the onset of the disease. Spectroscopic examinations of the blood in five cases were conducted. In one case only were the bands of oxyhaemoglobin seen in the serum. The serum of another case showed the spectrum of methaemoglobin.

In all the cases except two, in which methaemoglobin was present alone, the urine passed during the attack contained oxyhaemoglobin. In four cases this was accompanied by methaemoglobin.

On three of the five fatal cases autopsies were made. The most marked changes were in the liver, there being a profound destruction of the liver cells round the hepatic veins. In the cells of the portal zones there was a dark pigment which contained iron in loose organic combination. In the central zones there were blocks of yellow, iron-free pigment. [Compare this description with that of da ROCHA-LIMA for yellow fever. See *Beiheft. z. Archiv. f. Schiffs.-u. Trop.-Hyg.*, 1912. Vol. 16, p. 192.]

Experiments were made in three cases with the serum and the blood corpuscles, but the serum from the peripheral blood contained no specific antibodies for other human corpuscles or for washed corpuscles from the same source as the serum. Neither were the blackwater corpuscles found to be more susceptible to lysis or agglutination than normal corpuscles when subjected to the action of normal serum. As the author says, it is unlikely that autolysin would be found in blackwater serum, for when such an antibody passed into the circulation it would be anchored by the corpuscles in the blood stream.

Experiments carried out with watery extracts of the liver and spleen from fatal blackwater cases were not carried very far, and no conclusions can be drawn from such results as were obtained.

Clinical details of the cases conclude the report. In many instances differential eucocyte counts are given, but unfortunately the author

in some cases uses the term "small lymphocytes" and in others merely "lymphocytes," so that it is a little difficult to know what he really means by his nomenclature. It would, however, seem that a large mononuclear increase was a feature of all the counts made.

A. B.

JOHNSON (J. T. C.). **Blackwater or Haemoglobinuric Fever.**—*Far East Assoc. Trop. Med. C. R. Trois. Congrès Biennal. Saigon.* (1913). 1914. pp. 497–501.

In this paper the author gives the following list of conditions producing toxic or paroxysmal haemoglobinuria as distinct from the haemoglobinuria of blackwater fever :—

"1. Toxic conditions, as in poisoning by chlorate of potash, carbolic acid, arseniuretted hydrogen, quinine ; also as the result of the action of the venom of snakes, and of such vegetable poisoning as ricin, abrin, muscarin.

"2. As the result of the injection of the blood of one species or genus of animal into that of another species or genus.

"3. In infective disease : septicaemia, typhoid fever, scarlet fever, syphilis.

"4. In sunstroke, frost-bite, and after severe burns.

"5. In certain other conditions, of which the cause is not known and which are referred to as 'paroxysmal haemoglobinuria,' in Raynaud's disease, etc."

The rest of the paper, which deals shortly with symptoms and treatment, contains nothing novel or specially worthy of note.

A. B.

RINGENBACH (J.). **L'Opothérapie Rénale dans la Fièvre Bilieuse Hémogloginurique avec Anurie.**—*Bull. Soc. Path. Exot.* 1915. Mar. Vol. 8. No. 3. pp. 119–121.

The results of the physiological experiments of BROWN-SEQUARD and MEYER induced the author to test the effects of a renal extract called Nephrine in four cases of blackwater fever with anuria. It had previously been tried by AUDIAN, but the latter had employed other measures as well. Ringenbach used only the Nephrine, which is obtainable in ampoules and is administered by hypodermic injection. The quantity in a single ampoule, i.e. 2 to 3 cc., is sufficient for a dose, and each of the four cases recorded received only a single injection. In every instance benefit accrued. Although the anuria had persisted from 14 to 16 hours it ceased some hours after the injection and at the same time the temperature fell notably and the general condition improved. The author thinks that this organotherapy merits further trial in cases of blackwater complicated by anuria.

Nephrine is a solution consisting of one part of pig's renal tissue in two parts of physiological salt solution.

A. B.

Rand (R. F.). **Some Experiences in the Treatment of Malarial Fever in Rhodesia.**—*Med. Jl. of S. Africa.* 1915. Jan. Vol. 10. No. 6. pp. 103–106.

So far as malaria is concerned there is nothing in this paper calling for special comment or for a detailed summary. As regards blackwater fever in Rhodesia, the author notes that as a country becomes settled the disease tends to disappear and that it shuns the town. For some years past he has not known of any case originating in a permanent resident of the town of Salisbury, Rhodesia, though imported cases frequently occur. In treating blackwater complicated by a high temperature he believes in antimony, given in three grain doses of the pulvis antimonialis thrice daily, or an equivalent quantity of James's powder. He thinks antimony merits a wider use in the treatment of malarial infections. The Dutch settlers employ a decoction of the root of the wild plumbago for blackwater. It has probably a diuretic action.

A. B.

FEVERS IN THE TROPICS.

Fulle (G. B. Carlo). **Ricerche Morfologiche e Biologiche Intorno ai Bacilli Asiaticus 1, Asiaticus 2, Bacterium Columbense (Castellani). (Contributo alla Conoscenza di Alcuni Bacilli del Gruppo Tifo-Coli).**—*Sperimentale.* 1915. Jan. 20. Vol. 68. No. 6. pp. 721–740. With 6 figs.

After having made a very exhaustive study of the three organisms *B. Asiaticus* 1 and 2 and *B. Columbense*, isolated and described by Castellani, the author arrives at the conclusion that they are true species belonging to the typho-coli group; the *B. Asiaticus* 1 and 2 being more nearly allied to one another than they are to *B. Columbense*. In their morphological, cultural and serum reactions they differ from all previously known members of the iosarcae group. Numerous tables of agglutination and complemental fixation reactions are given and six microphotographs.

Castellani found the reactions of *B. Columbense* with lactose and milk very irregular; the author found in the strains examined by him that lactose was fermented with gas production, but that milk was rendered alkaline, this reaction separating it from paratyphoid B. The immunity reactions were also quite distinct from paratyphoid B.

P. W. Bassett-Smith.

Schueffner. **Pseudo-Typhus in Deli. (Variante der Japanischen Kedani Krankheit).**—*Far East Assoc. Trop. Med. C. R. Trois. Congrès Biennal. Saigon.* (1913). 1914. pp. 309–315. With 4 plates.

In 1902 the author observed a peculiar fever in Deli, Sumatra, which had some resemblance to typhoid, but neither reacted to the serum test nor gave the bacillus on blood culture. Since that time the disease has been frequently noted by himself and many others. A similar condition has been found in Japan and the Philippines. In the former the mortality is considerably greater (said to be 30–70 per cent.) than in Sumatra where it is 3 per cent., and the seasonal incidence is different, for in Japan it occurs chiefly after the periodic rains. In Sumatra there appear to be two seasons of high incidence, June and August, and November to January. It is probably conveyed in Japan by some insect, a small red mite; possibly by a tick in Sumatra. The site of the inoculation is shown as a small red spot, followed by necrosis of the skin and marked inflammation of the nearest lymphatic glands; in fact the presence of the glands is often of great help in finding the site of inoculation. The necrotic ulcer may be from 2 mm. to 7 mm. in diameter; it is not irritable but shows little tendency to heal; other glands in the body may be affected but are less marked than the primary ones. The second characteristic is an eruption, which appears about the second to third day and is at its maximum from the sixth to the eighth. It is a roseola, slightly raised, confluent all over the body but most marked on the trunk and flanks, and less on the face and limbs; it lasts 8–10 days, turns brownish and slowly disappears. Sometimes the rash is very slight, occasionally it is haemorrhagic and followed by distinct desquamation. The fever

resembles that of typhoid with its variations; usually there is a gradual rise of temperature followed by a continued type of fever; occasionally a rapid rise and termination by crisis is found.

The nervous symptoms are very like those of typhoid but in severe cases they generally continue after the fall of the temperature. Diarrhoea is rare, pulmonary complications are not uncommon, and albuminuria is generally present. The blood shows an increase in the white cells, particularly the lymphocytes, and the eosinophiles are diminished. Towards the end of the disease rheumatoid pains are complained of affecting the small articulations; convalescence is protracted. The serum reactions with Eberth's bacillus and para-typhoid A and B are always negative, neither has any organism been found in the blood or in the primary lesion. The author has not been able to infect monkeys with injections of the blood of cases nor to demonstrate whether the disease is due to a filtrable virus, nor has he been able to find any specific pathological changes in the organs after death. Four plates are given showing the appearance of the primary lesion and of the larval forms of the carriers.

P. W. B.-S.

Weir (H. H.). **A Continued Fever of Korea.** [Paper read before a recent Conference of the China Medical Missionary Association]. 9 pp.

In an analysis of his fever cases during the last two years in Korea the author notes that fifteen were of a peculiar type, which for want of a better name he calls para-typhus. They occur in the spring and early summer months, more than half being in May.

The onset may be associated with shivering and headache, the fever is high and the temperature runs a continued course terminating by lysis in the third week. Two charts are given. A well marked rash was present in the first week, varying in character, in some cases very like that of typhoid only generally more abundant and scattered over chest and abdomen; occasionally the spots were deep in colour and in two cases the eruption was very like that of typhus. There was no diarrhoea and pulmonary complications were frequent, though the author states that the râles characteristic of typhoid were not heard. Nervous symptoms were fairly marked; the patients lay on their backs and took little interest in anything around them, not remembering what happened (a toxaemic state); low delirium occurred in two cases. The spleen was rarely enlarged enough to be palpated. The disease differed from typhoid in its shorter course, and absence of abdominal symptoms and splenic enlargement; from typhus in its very low mortality and infectivity, general mildness and the termination by lysis.

[There is a reference to the disease known as "para-typhus" in Japan, but the author does not appear to be conversant with it. He does not mention in his cases the occurrence of ulcers of the skin or enlarged glands (as described by Schueffner above) nor does he appear to have made any attempt at clearing up the etiology by laboratory methods. These will be of interest in future communications as evidently we are dealing with a distinct disease.]

P. W. B.-S.

Bruch (A.). **Une Nouvelle Observation de Fièvre Boutonneuse de Tunisie.**—*Arch. Inst. Pasteur de Tunis.* 1914. Aug. 1. Vol. 9. No. 1. pp. 43.

A fresh case of this interesting fever is noted. The disease was originally described by the late Dr. A. Conor and the author under the name of Fièvre Boutonneuse or macular fever; other cases have been observed by Gabbi in Tripoli, and Balfour at Khartoum. In the present instance, a woman aged 56 living at Tunis was affected. She complained of fever, pains in the limbs and back, and had diarrhoea for one day. The eruption commenced to appear on the second to third day; at first discrete it became generalised and at the end of a week it was characteristic and had extended all over the body and lower part of the face; the palm of the right hand was affected but neither the left hand nor soles of the feet showed any sign. The tongue was coated, thirst was marked, urine scanty, stools normal, and the general condition was good. The patient stated that she had suffered much from mosquitoes, which came from a collection of water outside the window.

P. W. B.-S.

Fonseca (Manuel A.). **La Fiebre Roja de Caracas.** [The Red Fever of Caracas].—*Gaceta Med. de Caracas.* 1915. Jan. 31. Vol. 22. No. 2. pp. 9-16. With 11 charts.

An account of 13 cases of an eruptive fever which the author met with in the course of his practice at Caracas. It resembled dengue in having a two-peaked temperature curve and a scarlatiniform eruption which came out in two stages like that of dengue. Points of difference were the absence of any joint affections, and a tendency to suppression of urine in the early stages giving rise to a suspicion of yellow fever. Dengue has been already reported as occurring in Venezuela by Perez Fontado in a paper which appeared in *Gaceta Medica de Caracas*, No. 7, 1908, but the author finds that his cases correspond more perfectly to those described by Deeks and Perry from the Panama Canal Zone [see this *Bulletin*, Vol. 1, p. 244.]

J. B. Nias.

Fretz (W. L.). **Fevers in Peshawar.**—*Jl. R. Army Med. Corps.* 1914. Nov. Vol. 23. No. 5. pp. 518–521.

The fevers most frequently met with at Peshawar are, as in most other Indian cantonments, sand fly or three day fever, and malaria. With regard to the former no fresh experimental evidence was obtained, but the author notes that an eosinophilia was almost always present and that the disease caused a prolonged period of ill health. For prevention the use of formalin sprays in the bungalows gave unsatisfactory results; lime wash, to which formalin had been added, applied to the walls was more successful but was expensive.

Nineteen cases of malaria were treated with injections of amylopsin, but the results were not so satisfactory as those described by Major

LAMBELLE [see this *Bulletin*, Vol. 3, p. 148.] The injections gave rise to considerable local and general reaction and had little or no effect upon malignant or chronic cases; of the nineteen treated twelve had relapses. The experiences of Captain BLAKE at Cherat were similar, four out of five cases having relapses and the fifth having returned to the use of quinine. The author however states that possibly his method of administration of the drug may have been faulty and further experience may give better results.

P. W. B.–S.

PAPPATACI FEVER.

GABBI (Umberto). **Sul Modo come Avvenne la Comparsa e la Diffusione della "Febbre di Tre Giorni" nella Sicilia Orientale e nella Calabria Inferiore.** [The Advent and Spread of Three Day Fever in Eastern Sicily and Lower Calabria].—*Pathologica.* 1915. Feb. 1. Vol. 7. No. 150. pp. 51–55; & *Malaria e Malat. d. Paesi Caldi.* 1915. Jan.-Feb. Vol. 6. No. 1. pp. 21–26.

The author, who has devoted much time to the study of the fevers endemic in Southern Italy and Sicily, and has carefully examined the local epidemiological characters of three-day or pappataci fever, again brings his views very energetically forward. Apparently the first marked epidemic of the fever occurred at Messina in 1909, when it was looked upon as a peculiar form of summer influenza. In 1910 there was another severe epidemic from June to September, affecting about six thousand of the civil population and one thousand military. In the summer of 1911 the fever again appeared and spread to Calabria. The disease is known to be widely distributed in the Mediterranean area, particularly in the coast towns of the Adriatic and is always associated with the presence of pappataci flies. It has been shown that these flies can be carried alive for long distances, as from Malta to London and from Mostar to Vienna. The coasting mercantile and fishing fleets undoubtedly carry the infected insects from place to place and when conditions are favourable for their breeding epidemics are frequently started, as has occurred at Barcelona and other towns. One of the most important local factors in Italy and Sicily has been the severe earthquakes that have occurred, providing in the ruined walls favourable breeding places. The author notes that there has been a very great diminuation in the annual epidemics, from 6,000 cases in 1910 to a few hundred in 1914, and during this time the old walls in which the pappataci live have been greatly reduced in numbers. He believes that if the epidemics are to be prevented the Government must free the country from the ruined buildings resulting from the earthquakes and provide well built houses and proper sanitary requirements; measures should also be taken to prevent the importation of infected flies from endemic areas to those which are at present free. Another point on which he lays much stress is the financial aspect, for he computes that in the area of the earthquakes with a probable 50,000 persons attacked (Messina, as has been shown, alone had 6-7,000) the loss to the country would be one to one and a half million pounds, for though the fever is short the debility continues for weeks and incapacitates the affected, causing in many places industries to be partially stopped.

P. W. B.-S.

GABBI (U.). **Resultati di un Inchiesta sulla Febbre dei Tre Giorni nella Calabria Inf. e nella Sicilia Orientale.** [Result of an Enquiry into Three Day Fever in Lower Calabria and Eastern Sicily.]— *Lavori d. Soc. Italiana di Patologia Esotica.* 1914. p. 40.

Professor Gabbi while investigating the prevalence and economical factors of kala azar in Southern Italy and Sicily, distributed a number

of questions relating to the fever known as "three day fever" or pappataci fever. Twenty-two questions are asked, and when the answers have been collated they will afford much definite information of the true characters of the fever in that locality.

P. W. B.-S.

Pellegrino (Paolo Lombardo). **Su la Febbre da Pappataci o Febbre dei Tre Giorni. Definizione, Etiologia, Patogenesi, Profilassi.**—*Lavori d. Soc. Italiana di Patologia Esotica.* 1914. pp. 21–33.

The importance of this fever is very considerable for, though it is not a fatal one, yet it undoubtedly produces a prolonged period of incapacity for work amongst many of those affected, and thus becomes a social question of importance. The rapid diffusibility of the virus and the large numbers attacked in a locality make measures to check its spread rather urgent. The author has provided a very complete account of the history, distribution, etiology, and prophylaxis of the disease. He fully recognises the work done by English as well as Continental authors and summarises the whole in eleven conclusions which are too long to give here. It will, however, be noted that he prefers the name pappataci fever to three day fever—this separates it from dengue which is "una febbre da culex"—that ambulant forms are difficult to recognise and are efficient sources of infection, and that for prevention the destruction of the phlebotomus flies and their breeding places must be energetically carried out.

P. W. B.-S.

Spagnolio (Giuseppe). **Sintomatologia—Diagnosi—Prognosi e Cura della Febbre dei Tre Giorni.**—*Lavori d. Soc. Italiana di Patologia Esotica.* 1914. pp. 33–39.

The author gives a very full clinical description of the known characters of three day fever, "a fever associated with increased frequency of pulse and respiration with pains in the neck, body, and joints." The nervous symptoms are very marked and the depression of general powers continues long after the fever has passed. As a complication nephritis of short duration is sometimes found. Several varieties of the disease are mentioned, apyretic, abortive and prolonged (four or more days). The differential diagnosis generally rests between malaria, influenza, dengue, and thermic fevers. After the paper there was a discussion in which Professor Gabbi and others took part, referring to the nomenclature used and the part played by the phlebotomus flies in the distribution of the disease.

P. W. B.-S.

Zannini (William). **Sopra un Epidemia della Cosi Detta Febbre dei Tre Giorni in Comune di Leno (Brescia).** [An Epidemic of so-called Three Day Fever in the Commune of Leno].—*Gaz. d. Osp. e. d. Clin.* 1914. Dec. 17. Vol. 35. No. 135. pp. 2087–2088.

The occurrence of three day fever in an epidemic form has frequently been described from Southern Italy and the adjacent coasts of Sicily.

The author here draws attention to a true epidemic of the disease in the province of Leno (Brescia) which lasted from July to the middle of September. Over 70 cases were noted, but there were probably many more. The disease attacked all classes, but the country and labouring people between the ages of 15 and 45 suffered most. Generally the cases were isolated, but as many as six in a family were known to have been affected. The disease ran a mild course, but as usual it was followed by a more or less prolonged period of debility; for treatment salicylate of quinine was most commonly used. The clinical characters are rather fully discussed, but did not differ from those which are generally known. The author insists upon the importance of destroying the flies and their breeding places, old walls, etc., if this troublesome disease is to be prevented.

P. W. B.-S.

Walker (W. O.). **A Note on the Influence of Atmospheric Temperature on Sandfly Fever.**—*Indian Med. Gaz.* 1915. Feb. Vol. 50. No. 2. p. 60. With 1 chart.

After demonstrating that the incubation period of sand fly fever in Chitral is from three to five days, the author shows, by means of a chart giving the maximum shade temperature and the daily incidence of cases, that with the rapid rise of temperature in May there was an influx of cases and that any fall in the temperature was followed five days later by a fall in the number of cases until the end of June, when nearly all the non-immunes had contracted the disease. After that date though the temperature still remained very high the number of cases was small. The high atmospheric temperature is not the cause of the disease, but it influences its production. The author also states that the resulting debility increased the severity of an epidemic of typhoid which followed.

P. W. B.-S.

Bolt (R. A.). **Sandflies (Phlebotomus) in China and their Relation to Disease.** [Paper read before a recent Conference of the China Medical Missionary Association]. 10 pp.

From his experience in Pekin the author draws attention to the commonness of sandflies and febrile reactions due to these in Northern China. May and June are the worst months and the flies are most abundant near old crumbling buildings. The natives of the part appear to be immune, but all others suffer from these pests, particularly the young children. Febrile attacks of three days are common, followed sometimes by prostration for a week or more. The author by means of a form which he sends out endeavoured to map the distribution of the sandflies in China and from the returns he gathers that they do not occur in Southern China, are rare along the Yangtze, and reach the maximum prevalence in a line from Tientsin and Pekin to Shanhaikwan (40th parallel). The species of Phlebotomus present is yet undetermined, but specimens have been sent to Profe sor Newstead for identification.

P. W. B.-S.

Sergent (Edm.). **Première Note sur les Phlébotomes Algériens.**—*Bull. Soc. Path. Exot.* 1914. Nov. Vol. 7. No. 8–9. pp. 660–662.

During the last ten years *Phlebotomus papatasii* has been noted in Algeria, being widely distributed in the Mediterranean ports, in the oasis of the desert, and on the high plateaus. In 1904 the author showed that these flies were agents in spreading the Biskra boil and perhaps various fevers, as phlebotomus fever, dengue and three or seven day fever. He here states that these beliefs so far rest on no secure laboratory foundation, and much more work is required to settle definitely the etiology of these diseases in Algeria. The species and distribution in Algeria as at present known are :—

P. papatasii in all the coast towns, most commonly in July, August, and September.

P. papatasii, *P. minutus* var. *africanus*, and *P. perniciosus* found on the high plateaus (800–1,000 m.) only in the first three weeks of September.

At Beni-ounif-de-Figuig during October the *P. papatasii* are very troublesome, and *P. minutus* is very rarely seen. At Biskra, *P. papatasii* and *P. minutus* are about equally abundant in the hot summer–autumn months, but *P. perniciosus* is very rare.

P. W. B.-S.

OROYA FEVER AND VERRUGA PERUVIANA.

Strong (R. P.), Tyzzer (E. R.) & Sellards (A. W.). **Oroya Fever. Second Report.**—*Jl. Amer. Assoc.* 1915. March 6. Vol. 64. No. 10. pp. 806–808.

In the first report the etiological characters of this fever were discussed and its relationship with Verruga particularly referred to, the definite opinion being stated that the two diseases were quite distinct. In this paper the seasonal prevalence and clinical manifestation of Oroya fever or Carrion's disease are studied. The distribution is not limited to the Oroya valley ; it probably extends to many other valleys of the Peruvian Andes. The disease is most prevalent from January to April though cases occur in other months, but no very definite conclusions can be drawn at present. In the description of the clinical features there is very little new information ; the incubation period is, however, stated to be about twenty days. In published accounts undoubtedly other diseases have frequently been described as Oroya fever, particularly para-typhoid infections. The blood changes, which are very intense, are described fairly fully, the extreme anaemia and presence of the intra-corpuscular bodies known as *Bartonella bacilliformis* being the most important. The mortality is probably from 30 to 40% though some observers place it much higher, 75%.

P. W. B.-S.

Strong (R. P.) & Tyzzer (E. E.). **Pathology of Oroya Fever. Third Report.**—*Jl. Amer. Med. Assoc.* 1915. Mar. Vol. 64. No. 12. pp. 965–968.

This very interesting account of original work helps to place the etiology of the much misunderstood Oroya fever on a firm scientific basis. In previous literature very little reliable information on the pathology is to be found, the monograph of Odriozola (1898) being the most important. In this he draws attention to the condition of anaemia, and congestion of the lungs, liver, spleen, lymph and mesenteric glands. The authors drew most of their deductions from material collected by themselves, but they also examined specimens from the Dos de Mayo hospital of Lima.

The gross pathological changes were, anaemia with small haemorrhages and oedema, marked emaciation, congestion or oedema of the lungs, spleen usually enlarged and containing infarcts, liver large and flabby with mottled areas of necrosis, mesenteric and lymphatic glands swollen and pink in colour ; in the large intestine there were occasionally superficial ulcers, and the bone marrow had a soft grey appearance.

The histological changes were particularly interesting. The liver cells, especially round the hepatic veins showed fatty and hyaline changes, forming areas of toxic degeneration producing tissue necrosis ; pigment in small quantities was present which did not react for iron. In the spleen infarcts were common and in the infarct area, which is much congested, leucocytes could be shown migrating into the necrotic tissue ; the veins contained thrombi, indicating injury to the endothelium by some toxic substance. Pigment in large or small granules,

but unlike that of malaria, was present as well as large endothelial cells containing rounded or rod-shaped bodies. In the bone marrow there were marked evidences of phagocytosis by the endothelial elements of both the red and white cells. "The extensive phagocytosis found in the liver, spleen and bone marrow indicates the presence of a toxic substance which has led to chemical changes or injury of the engulfed cells." In the lymph glands the most striking pathological changes, as seen also in the spleen, were the large swollen endothelial cells, attached or free in the blood vessels; many were distended with round or rod-shaped bodies (*Bartonella bacilliformis*) and it is probable that the multiplication phase takes place within these cells; these are best seen in fresh smear specimens stained with Giemsa. Sometimes the cells contain few of these bodies, at others they may be distended with rounded masses or spheres, each having a definite number (not stated) of minute points of chromatin. Similar distended endothelial cells were seen in the blood vessels of the mucosa and in the lymphoid tissue of the ulcerated large bowel, the affected cells sometimes obstructing the lumen of the vessel.

From a study of the cells it would appear that the spheres break up into a large number of minute elements each containing a chromatin granule; these elongate and finally appear as distinct rods containing a granule of chromatin at one end; when the sphere is ruptured and the bodies are set free, the rods are most apparent. These are identical with the bodies seen in the red cells in the peripheral blood. The appearances in the endothelial cells of the lymph glands in Oroya fever are very like those pictured by Gonder in the life cycle of *Lympho-haematocytozoon parvum* (*Theileria parvum*). From these observations the authors think that *Bartonella bacilliformis* should be classed as a protozoon related to the above mentioned organism. They were able to demonstrate similiar pathological characters in some of the Mayo hospital specimens. They also show how errors are not infrequently made by mistaking cases of tuberculosis for verruga and Oroya fever, though of course the two may possibly coexist.

[The wording in the paragraph on the relationship of verruga and Oroya fever to tuberculosis is badly put, and unfortunately the paper is unaccompanied by any plates or diagrams; these no doubt will soon be published.]

P. W. B.-S.

Strong (R. P.) & Tyzzer (E. E.). **Experiments relating to the Virus of Verruga Peruviana. Fourth Report.**—*Jl. Amer. Med. Assoc.* 1915. Apr. 3. Vol. 64. No. 14. pp. 1124–1127.

In previous publications the authors have reported that they were unable to transmit the parasite of Oroya fever into animals either by subcutaneous, intravenous, or by intra-testicular inoculations, but that the virus of verruga could be passed on. In the present paper they give the result of their further experiments bearing on the transmission of verruga, to determine if the disease was directly inoculable, if a visible micro-organism was present, if it was a spirochaete, and lastly to differentiate the disease from framboesia and syphilis. They found that the monkey was the most susceptible animal but that a certain

amount of success was obtained with both dogs and rabbits. In monkeys subcutaneous inoculations gave rise to local sores, never to generalised infections. They were able to transmit the virus through twelve successive series and they have had positive results in twenty-five monkeys. The virus however becomes gradually attenuated and failures were not infrequent. In the dog subcutaneous inoculations were occasionally successful and the lesion when produced was more vascular than when found in the rabbit's testicle. By intra-testicular inoculations in rabbits and dogs a characteristic lesion was sometimes produced after an incubation period of 10–22 days; by sub-inoculations the virus becomes attenuated.

The authors were able to confirm Cole's finding that the histological structure of the nodules produced in monkeys was similar to those found in man. Experiments to cultivate the virus by the method described by Noguchi were not successful though suggestions of growth were obtained, from which on the sixteenth day of the culture, a number of papules were produced in a monkey after 21 days' incubation; these did not mature showing that the virus though still living was in an attenuated form. The results of inoculation of filtrates from verruga nodules were not conclusive when made from human or animal sources. The failures might be due to the virus being too small in quantity or too attenuated in character to produce lesions in animals having a relatively low susceptibility.

No definite micro-organism could be demonstrated by any method and the authors consider it not unlikely that the virus will prove to be a filtrable one. There seems to be some analogy between the virus of verruga and that of small pox: both can be locally inoculated and give rise to localised lesions; both produce a specific immunity after inoculation. Neither the virus of small pox nor verruga have been cultivated in vitro in artificial media, and from both, chlamydozoa-like bodies have been reported.

P. W. B.-S.

Odriozola (E.). **Enfermedad de Carrion.** [Carrion's Disease].—*Cronica Med.* [*Lima.*] 1914. May. Vol. 31. No. 610. pp. 147–152.

A clinical lecture on a case of Carrion's disease. The patient, a boy of 14 years of age, had only suffered from the symptoms for a few days before entering the hospital, having previously enjoyed good health. The illness began with fever, vomiting and great prostration with increasing anaemia. The number of red corpuscles per cubic millimeter had fallen to 1,800,000 in the course of nine days. A single button of the characteristic type was in course of development on the left instep, leaving no doubt as to the diagnosis. Some remarks on the clinical features of this mysterious disease conclude the paper.

J. B. Nias.

MISCELLANEOUS.

Breinl (A.) & Priestley (H.). **Observations on the Blood Conditions of Children of European Descent residing in Tropical Australia.**—*Ann. Trop. Med. & Parasit.* 1914. Dec. 15. Vol. 8. No. 3. pp. 591–608. With 3 charts.

The authors point out that tropical anaemia, that is anaemia due to climatic influences after prolonged residence in the tropics, was, up to recently, a generally accepted condition; in many cases it was probably not differentiated from a secondary anaemia brought about by parasitic invasion. An account is given of the investigations on this subject from 1889 to those of Chamberlain in the Philippines, which concerned 702 soldiers resident there about 20 months. It is pointed out that the conclusions, with one exception, are based upon a comparatively small number of blood counts and haemoglobin estimations, and Chamberlain's averages were obtained from persons who had resided in the tropics for a short time only.

"Opportunity was therefore taken to make observations on similar lines in Townsville. In tropical Queensland a second and, to a limited extent, a third generation of children is growing up at the present time. A sufficiently large number of blood counts and haemoglobin estimations on children of ages between 7 and 15 years who had been residing in Townsville during the whole or most of their life would, in our opinion, furnish more convincing evidence on the influence of a tropical climate, as prevailing in the coastal belt of North Queensland, upon the blood conditions of a transplanted European race. Sufficient time would have elapsed for any alteration due to climatic influence only to become established."

An account is given of the technique. The children examined were between the ages of 7 and 16. Boys and girls are considered separately and the averages are set down for each age. One of several tables is reproduced.

Table 6.—Comparison of the average number of erythrocytes and haemoglobin value of 305 schoolboys and 269 schoolgirls of Townsville.

Average erythrocyte count.	Average number of leucocytes.	Haemoglobin.		
		Average absolute content.	Average percentage.	Average colour index.
Boys, 5,046,100	10,868	12·31	89%	0·88
Girls, 5,107,700	9,077	12·66	92%	0·90
5,076,900	10,036	12·485	90·5	0·89

The enquiry extended over a period of 12 months. A comparison of the figures obtained in the dry and wet season respectively shows that the climatic conditions, as such, had no pronounced influence upon the number of red blood corpuscles in the peripheral circulation.

The following are the conclusions of this valuable paper:—

"Careful blood examinations were performed on 574 school children in Townsville, of European descent, of ages between 7 and 15, of whom the majority had been born and had resided in tropical Queensland during their whole life.

"The results indicate :—

"1. That the average number of red blood corpuscles is not diminished when compared with analogous figures for children born and bred in a temperate climate.

"2. That the average haemoglobin content of the blood is normal.

"3. That the number of leucocytes is slightly increased.

"4. That the average blood pressure does not show any difference from that of normal children in temperate climes."

A. G. B.

Breinl (A.) & Priestley (H.). **Changes in the Neutrophile Blood Picture of Arneth observed in Children living in Tropical Queensland.**—*Ann. Trop. Med. & Parasit.* 1914. Dec. 15. Vol. 8. No. 3. pp. 565–574. With 1 chart.

Chamberlain and Vedder in their investigations on the effects of a tropical climate on white men made 72 Arneth counts on American soldiers and 50 on Filipinos. They were led to the conclusion that "the average Arneth picture showed a marked shift to the left in the case of Filipinos and a slight drift in the same direction for Americans resident more than one year in the Philippines."

Table 3.

	Arneth Classification per cent.					Index Arneth
	I	II	III	IV	V	
Average for 72 healthy Americans in Philippine Islands	13·3	32·9	37·2	14·6	2	46·2
Average for 50 Filipinos ..	27·5	38·3	25·8	7·5	0·9	65·8

In Breinl & Priestley's experiments—

"Two nuclear fragments, connected by a thread only, were counted separately, whilst they were counted as one when connected by a distinct bridge. In case of uncertainty regarding the class to which a cell belonged, the higher class was chosen. Only perfectly prepared films were used, and in each case 200 successive cells were enumerated. Each 100 was counted separately, and when the figures were consistent the count was accepted." The films were stained by Giemsa.

Arneth and differential counts were performed on the blood of 150 unselected children of ages between 7 and 15 and are tabulated according to the ages. The averages given in the table indicate that the Arneth index of normal healthy children who have resided in tropical Queensland for the whole or most of their life is very high indeed, compared with the average figure of children living in a temperate climate ; in other words it shows a well-marked shift to the left. The results of the authors and of the Philippine observers are represented graphically in a chart. The Arneth index of North Queensland children is seen to resemble closely that of Filipinos.

In the authors' opinion "the Arneth picture is an expression of the functional activity of the leucopoietic system, especially the bone marrow, rather than that of phagocytic activity. The presence of a large number of neutrophile leucocytes belonging to Class I indicates a greater activity of the bone marrow but does not necessarily imply

that the resistance of the organism is lowered in any way." In their experience the North Queensland children show no greater susceptibility to infectious diseases than the same class in Europe.

In the differential leucocyte counts 500 successive leucocytes were enumerated. The average number of ploymorphonuclears is somewhat lower than in Europe. This is in accordance with the findings of CHAMBERLAIN and VEDDER, who obtained an average of 56·1 per cent. for the polymorphonuclears of American soldiers in the Philippines. The average of eosinophiles is distinctly increased, from 2 to 4 per cent. in Europe to 7·7 per cent. Children suffering from helminthic infections were as far as possible excluded. The average differential counts were as follows :—

Polymorphonuclears	56·1
Transitionary	4·2
Large mononuclears	2·4
Lymphocytes	29·5
Eosinophiles	7·7
Mast cells	0·04

Average total number of leucocytes 10,751.

The conclusions are as follows :—

"1. The number of polymorphonuclear neutrophile leucocytes in the blood of the children living in tropical Queensland is distinctly decreased, the number of eosinophile leucocytes markedly increased.

"2. The Arneth count performed on 150 school children living in tropical Queensland shows a marked shift to the left, the Arneth index being 74·5 as compared for normal individuals (Arneth) in Europe.

"3. The 'shift to the left' in the Arneth blood picture is, in our opinion, due to the effect of a tropical climate upon the white race living in the tropics."

[As the text-books do not seem to describe Arneth's index an account of it is given.]

"A classification of polymorphonuclear neutrophiles based on the number of nuclei or nuclear fragments was proposed by Arneth in 1904. He described five main classes. Class I has a single nucleus which may be round or of irregular shape. . . . Class II includes the neutrophiles with two nuclei or nuclear fragments. Class III has three nuclei or fragments and is the largest class in normal blood. Classes IV and V have respectively four and five nuclei or nuclear fragments. A fairly constant proportion between the different classes is found in normal blood. The "neutrophilic blood picture" as given by Arneth is for each 100 polymorphonuclear leucocytes as follows :—

Class I	Class II	Class III	Class IV	Class V	Index (Arneth).	Index (Bushnell and Treuholtz).
5	35	41	17	2	40·0	60·5

"Simon gives the following normal range for each 100 neutrophiles:—

Class I	Class II	Class III	Class IV	Class V
4–9	21–47	33–48	9–23	2–4

"The so-called nuclear fragments seldom if ever represent separate nuclei, but only lobes of a polymorphous nucleus, the connecting nuclear substance being drawn out into a fine thread. The "index" is a standard for comparison of different pictures. Arneth adopted as an "index" the sum of classes I and II while Bushnell and Treuholtz selected the sum of classes I and II and one-half of class III.

"The polymorphonuclear leucocyte is the active phagocytic cell of the blood stream and the corpuscles with three or four nuclear fragments are considered the adults and are thought to be most active as phagocytes and best fitted to protect the body against invading organisms. The superannuated cells represented by class V and the immature cells represented by classes I and II are less able to take up the defence of the body. . . .

"When the first and second classes are increased above normal and the third and fourth are correspondingly decreased the condition is spoken of as a "shift or a drift to the left" while the reverse alteration is called a "shift to the right." . . . Arneth considers a shift to the left an evidence of lowered resistance to the disease affecting the patient whose blood he is studying, as is indicated by the fact that when a tubercular patient improves the blood picture tends to return to the normal."*

A. G. B.

Breinl (Anton). **The Distribution and Spread of Diseases in the East. Protozoa and Disease. The Influence of Climate, Disease, and Surroundings on the White Race Living in the Tropics. (Being the Stewart Lectures of the University of Melbourne, 1913).**— 31 pp. With 31 figs. 1914. Melbourne: By Authority: McCarron, Bird & Co.

The author writes that "the preservation of Tropical Australia can only be accomplished by means of the study and the eradication of tropical diseases present, by the prevention of the introduction of new diseases, and by the study of the influence of climatic and economic conditions upon the white settler in Northern Australia, with a view to eliminating any influences which might lead towards the deterioration of the race." This indicates the scope of the three lectures, which were probably delivered before a lay audience. The first contains data of interest to readers of this *Bulletin*.

Malaria. The distribution of malaria in Australia corresponds on the whole with that of the mosquito *Nyssorhynchus annulipes*, which acts as the carrier.

Dengue was introduced into Queensland in 1894 or probably earlier, and now and again reappears.

Undulant fever has hitherto not been recorded.

Dysentery. Bacillary dysentery is responsible for a large number of deaths among the natives of New Guinea and is the most important disease in that island from the economic point of view. It has been introduced into Thursday Island (Torres Straits) by labourers recruited from New Guinea.

Sprue is confined to the coastal belt of Queensland between Mackay and Cairns.

Leprosy is met with in New Guinea; it is comparatively rare in Australia.

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*Chamberlain (W. P.) & Vedder (E. B.). A Study of Arneth's Nuclear Classification of the Neutrophiles in Healthy Adult Males and the Influence thereon of Race, Complexion, and Tropical Residence.— *Philippine Jl. Sci.*, Sect. B, Trop. Med., 1911. Vol. 6, pp. 405–407.

Beriberi has been observed among the native labourers in New Guinea and numerous cases have originated among the coloured crews of the pearling boats in Thursday Island.

Yaws prevails in the Torres Straits Islands and among the aborigines of the Northern Territory. In New Guinea the disease is rampant.

Filariasis is irregularly distributed in Queensland; it is more prevalent in Brisbane and Port Douglas than in Townsville. In Brisbane nearly 17 per cent. of admissions to hospital show the parasite in their blood.

Gangosa is endemic in British New Guinea, and has been found in the Torres Straits Islands.

Juxta-articular nodules were described from New Guinea by Sir William MacGregor.

Ankylostomiasis is frequent in North Queensland; both *A. duodenale* and *N. americanus* are frequently encountered. The American hookworm is more common in New Guinea. The disease has not been found in the Australian mines.

Stegomyia fasciata is very frequent in Darwin and is found as far south as Brisbane. The temperature in Northern Australia during the summer months is high enough to enable the yellow fever parasite successfully to undergo its development in the mosquito. A thorough and energetic campaign against *S. fasciata* is recommended.

In the third lecture Breinl calls attention to comparative measurements of the violet and ultra violet rays of the solar spectrum by means of the photocatalytic decomposition of oxalic acid in the presence of uranyl acetate (Freer), made at Townsville and Brisbane, and to a few observations on the blood of school children made by Priestley and himself, and concludes that our knowledge of the influence of climate *per se* is very limited. Finally he states that by reason of the diversity of climates and practical absence of native population Tropical Australia offers far more favourable conditions than any other tropical country for permanent white settlement.

A. G. B.

Calderon (Fernando). **Some Data concerning the Medical Geography of the Philippines.**—*Philippine Jl. Sci.* Sect. B. Trop. Med. 1914. June. Vol. 9. No. 3. pp. 199–218.

A description is given of previous writings on this subject, the first of which was published in 1857. The following is an account of some of the diseases which have an important influence upon the mortality of the Philippine Islands. The author expresses acknowledgments to the Director of Health, Dr. V. G. Heiser.

Beriberi causes approximately 5,000 deaths per annum. There is much evidence to show that beriberi in mothers affects the nutritive value of their milk; this is believed to be one of the causes of 'taon' among children. It is noted that three times as many breast-fed infants die as bottle-fed infants. In Government institutions the substitution of unpolished for white rice has caused the deaths from this disease to fall from an average 600 per annum to nil. In Cebu Island, where corn is the staple article of diet, there is practically no beriberi and taon is exceedingly rare.

Malarial fever is responsible for at least 25,000 deaths per annum. There are now 700 agencies for the distribution of quinine.

Smallpox has been much reduced by systematic vaccination. Glycerinated vaccine has been found to be of doubtful value after it has been removed from an icebox for longer than ten days. Recently a powdered vaccine has been prepared, which it is hoped will keep longer.

Leprosy causes at least 1,000 deaths per annum, and probably as many new infections. The lepers are now segregated at Culion and new cases of the disease have been reduced in number. It is noted that, whereas Cebu Island has approximately one-tenth of the population of the Philippines, it has furnished over one half the lepers that have been collected.

Amoebic and *bacillary dysentery* still prevail to a very large extent. On Catanduanes Island, which is noted for its poor water, there were several hundred deaths in 1912 from bacillary dysentery, whilst in towns where there is good artesian water bacillary dysentery is becoming less and less common.

Filariasis varied in its incidence in the different islands; among prisoners from Leyte 35 per cent. were infected (*Filaria nocturna*), from Bataan 3 per cent., other islands being intermediate.

Tuberculosis is believed to cause 40,000 deaths annually. An Anti-tuberculosis Society was organised in 1910. The author thinks that a more active campaign is necessary.

He concludes that if modern knowledge which is already available could be successfully applied, 100,000 deaths in the Philippine Islands could be prevented annually.

The author sent certain questions to a large number of physicians located in the islands and received answers from 95, tabulated at the end of the paper. These show that the three diseases which predominate in the whole archipelago are pulmonary tuberculosis, malaria, and dysentery, whilst next come beriberi, the intestinal parasites, gastro-enteritis, bronchitis and broncho-pneumonia.

A. G. B.

VADON. **Un Poste Médical Consulair en Chine, Yunnan-Fou.**—*Ann. d'Hyg. et de Méd. Colon.* 1914. Apr.-May-June. Vol. 17. No. 2. pp. 501–525. With 1 plate.

In this paper an account is given of the hospital work carried on by the author in conjunction with Dr. BUI-BAN-QUY. Yunnan-Fou lies at an altitude of over 6,000 feet on the 27th degree of North latitude; the province adjoins Burma. Its population is about 100,000. It is situated in the middle of a great plain. The population lives in a state of promiscuity and dirt without the slightest idea of public or private hygiene, so that one would expect to see severe epidemics. Such however are unknown; in four years' stay the author has not seen a single case of plague or cholera, though Yunnan has been described by several authors as an endemic focus of plague. Typhoid fever and bacillary dysentery, if they exist, are very rare, though the wells contain much organic matter. It is noted however that the Chinese take almost all their liquid in the form of tea. There is a certain amount of small-pox. In 1912 739 people

were vaccinated with lymph from Tonkin with excellent results. *Malaria* is found, but it is very rare and the cases are light. Four or five years ago the land round the town was under rice and mosquitoes abounded ; now the rice has given place to dry cultivation. Anopheles are rare, chiefly *A. maculipennis*. Of the three species of parasite, *P. vivax* has been met with most frequently, but *P. malariae* and more rarely *P. falciparum* have also been observed. No case of remittent fever or haemoglobinuria has been observed.

Leprosy is fairly frequent. Nerve leprosy occurs in the proportion of 60 per cent., mixed leprosy of 25 per cent., and tubercular leprosy of 15 per cent. The Chinese attribute the disease to the ingestion of fowls' eggs. Fowls, they say, themselves suffer from leprosy. This legend was investigated by the author and proved to be without foundation. *Tuberculosis* is relatively rare, the pulmonary form surprisingly so, although the very numerous inhabitants live crowded in narrow dark lanes where light rarely penetrates. It is possible that a number of children succumb to unrecognised phthisis. Tuberculosis of the skin, glands and bones is very common and usually mild. The severe lesions of tertiary *syphilis*, such as sclerosis, gummata, visceral lesions and cerebral lesions are very rare, and tabes and general paralysis are unknown. The hereditary form of the disease is frequent. The author uses two intravenous injections of salvarsan at three weeks' interval, the first 40 cgm., the second 20 cgm. *Goitre* is extremely common ; it is attributed by the Chinese to the use of rock salt. Statistics of the patients treated follow.

A. G. B.

Collin (L.). i. **Aperçus Démographiques sur les Îles de la Loyauté.**—*Bull. Soc. Path. Exot.* 1914. July. Vol. 7. No. 7. pp. 600–604.

ii. **Hygiène des Indigène des Îles de la Loyauté.**—*Ibid.* pp. 598–600.

i. According to the author's own observations and the views of the principal native chiefs the inhabitants of two at least of the Loyalty Islands are steadily decreasing in numbers. Two causes are given : the departure of men to New Caledonia to become artisans, labourers, or servants, and sterility. The numbers of the sexes in various villages are given to show the disproportionate number of women. The proportion of childless households was noted in eleven villages ; in eight it was over 20 per cent. and in one it reached 50 per cent. The figure for France is given as 14 to 16 per cent. In an endeavour to ascertain the cause 24 households were examined. There was found a complete absence of hygiene in the women, uterine affections with purulent discharges in 17, chronic gonorrhoea as a rule in the men, and old orchitis in several instances. Tuberculosis is noted as common and this and gonorrhoea are believed to be the chief causes of the progressive depopulation. High infantile mortality is also noted.

ii. A vivid account is given of the insanitary conditions in which these natives live.

A. G. B.

Remlinger (P.). **Les Populations Nomades du Maroc au Point de Vue de la Propagation des Maladies Infectieuses.**—*Paris Méd.* 1914. Aug. 1. Vol. 4. No. 35. pp. 234–235.

The author, who is Director of the Morocco Pasteur Institute, writes that there are few epidemiological factors in that country as important as the movements of the nomad tribes. He distinguishes three types of nomadism—small, medium and great, the last of which is very important. The small type of nomadism is that which takes place within the territorial limits of the tribe. Several tribes move their tents frequently in the course of the year in the search for pasture. This sort of nomadism will become less as the country advances. The extreme degree of nomadism is represented in Morocco by the migration of the Draouat who inhabit the valley of the Oued Dra to the south. Many of these are agricultural labourers and therefore the chief movement takes place at the time of harvest, but it goes on all the year. The Draouat leave their country in small bodies, not recognising the authority of any chief. Each travels at his own expense and leaves his companions when he finds work. The men do not bring tents or mats and carry very little luggage. A large part of Morocco is said to be furrowed from north to south throughout the year by the Draouat caravans.

The chief diseases which they spread are plague, typhus, smallpox and granular conjunctivitis. Various outbreaks of plague since 1909 have been traced to them. With regard to smallpox, vaccination is unknown, and as regards typhus, seeing that they only leave their clothes when their clothes leave them, they are sure refuges for pediculi. In all the coast towns epidemics of smallpox and typhus coincide with the arrival of the Draouat. It is pointed out that they would play an equally important part in the propagation of cholera.

As regards the measures which can be taken the author suggests the establishment at some distance from every town of an observation post. These would be large, walled sites where tents could be erected; here the nomads could pass the night, get a bath and have their clothes disinfected. They would be kept there a day or two before entering the town and they would be vaccinated. Supervision at their point of departure is at present impracticable.

A. G. B.

Ruediger (E. H.). **The Germicidal Power of Glycerin on Various Micro-Organisms under Various Conditions.**—*Philippine Jl. Sci.* Sect. B. Trop. Med. 1914. Nov. Vol. 9. No. 6. pp. 465–477.

The author writes that though glycerin is extensively used, especially as a preservative in vaccine virus, little has been published regarding its germicidal properties. He therefore made tests to find out to what extent glycerin may be relied on to sterilize bacterial vaccines. The germicidal power was tested on the typhoid bacillus, *Staphylococcus albus*, *S. aureus*, and the bacilli of anthrax, plague, cholera, diphtheria and glanders, the glycerin being diluted with physiological salt solution at room temperature and at 15° C., with bouillon at room temperature, and with horse serum at room temperature in the several experiments.

In another experiment four strains of plague bacilli were tested comparatively. The results are set forth in tables.

The conclusions are as follows :—

" Glycerin has a distinct although feeble germicidal action.

" The germicidal action varies greatly with the temperature, being much feebler at a temperature of 15° C. than at from 30° to 35° C.

" The germicidal action varies with the diluent employed ; in glycerin diluted with physiologic salt solution the micro-organisms died much sooner than in glycerin diluted with bouillon or with horse serum.

" In dilutions up to 50 per cent., glycerin did not destroy the bacillus of anthrax in fifteen days. This may be due to the presence of spores.

" Glycerin seems to be a selective poison for the bacillus of plague, the spirillum of cholera, and the bacillus of diphtheria.

" In 50 per cent. of glycerin in physiologic salt solution all the nonspore-forming organisms died in less than four days.

A. G. B.

Crowell (B. C.). **The Chief Intestinal Lesions encountered in One Thousand Consecutive Autopsies in Manila.**—*Philippine Jl. Sci.* 1914. Sept. Sec. B. Trop. Med. Vol. 9. No. 5. pp. 453–460.

The author's summary and conclusions are as follows :—

" In a series of 1,000 consecutive autopsies in Manila, performed during eighteen months, aside from the incidence of intestinal parasites and tumours and the lesions in bubonic plague, intestinal lesions have been encountered in 292 cases. In this series Asiatic cholera (on account of an epidemic occurring during this period) stood first numerically. Second in importance was intestinal tuberculosis, and attention has been drawn to the possibility of the occurrence of dysenteric symptoms in this condition and to the perforation of intestinal ulcers in three cases. Typhoid fever was present more frequently than either entamoebic or bacillary colitis, and these typhoid cases showed a high percentage of perforations (30 per cent.) and haemorrhages (12 per cent.), all of the cases being among Orientals. Entamoebic and bacillary colitis have been encountered with less frequency than the preceding diseases, and have presented many of the possible complications and sequelae. Liver abscesses occurred in 29 per cent. of the entamoebic cases, and in 2 cases the intestines had perforated. Bacillary colitis was present more frequently in children than in adults. Nine cases of duodenal ulcers were encountered, 6 of which had perforated, and 15 cases of peptic ulcer of the stomach occurred in the same series. Severe anaemia and symptoms referable to the gall bladder were prominent in some of the cases of duodenal ulcer. Unclassified, probably non-specific inflammatory lesions of the intestines, especially in infants, occupy an important place, and offer a promising field for further etiological study."

The cases were derived from a large hospital, a hospital for contagious diseases and the medico-legal services of the city of Manila. The overwhelming majority were Filipinos. Bubonic plague and Asiatic cholera furnished 149 of the cases. The incidence of the diseases was as follows :—

Asiatic cholera	92
Intestinal tuberculosis	56
Typhoid fever	39
Entamoebic colitis	31
Bacillary colitis	25
Duodenal ulcer	9
Noninfectious or unclassified inflammatory lesions of intestines	57

In 17 cases two or more of the above lesions were coexistent in the same case.

It is noted that during the fiscal year 1913 tuberculosis was responsible for 17·9 per cent. of the deaths of the residents of the city of Manila. Of the 56 cases the tuberculosis was generalised in 35, in three there was a perforation by a tuberculous ulcer, and the remainder died from intercurrent diseases. The author writes it would seem important to remember that an extensive tuberculous colitis can closely simulate an entamoebic colitis. Of the 31 cases of entamoebic colitis 9 died of liver abscess, 5 of acute peritonitis, 3 of toxaemia, and the rest from intercurrent diseases. Of the 25 cases of bacillary colitis 14 occurred in children under seven years of age. In 12 of the cases there was involvement of the lower portion of the ileum. Broncho-pneumonia is stated to have been present in from one third to one half of the cases.

Of the unclassified cases 35 occurred in infants and 22 in adults. The cases in children were not cholera nor were they of the type of bacillary colitis. The majority of the infants were extremely emaciated and many had broncho-pneumonia ; diseases of the skin were frequent. The author is doubtful whether to account for these cases " by poor or injudicious feeding, by actual, exogenous infection, or by the action of the normal flora of the intestine under unfavourable conditions."

A. G. B.

Butler (C. S.). **The Application of Wassermann's Reaction to the Solution of the Etiology of Tropical Ulcerations.**—*Far East. Assoc. Trop. Med. C. R. Trois. Congrès Biennal. Saigon* (1913). 1914. pp. 395–405.

The author, who is a surgeon in the U.S. Navy and writes from the Philippines, notes that in the classification of tropical ulcerations there is considerable confusion, due largely to the fact that it is upon an etiological basis. Two or more causes frequently operate in the same body—tuberculosis and syphilis, syphilis and leishmaniasis, etc.

He proceeds to criticise the inadequate methods used to determine the causes of these ulcerations. The clinical appearance, for example, is very deceptive, as may be the examination of the stained and fresh exudate. In cases of tropical phagedaena and the so-called gangosa, unless we unmask the underlying dyscrasia " we may search in vain the ulcer exudate, and section to no purpose the tissue of which the ulcer is composed." The examination of scrapings or tissue sections often gives valuable information, revealing for instance acid-fast organisms or leishmania.

He proceeds to discuss the Wassermann reaction and its results. He performed the test as done by Emery on 647 natives of the Philippines. Of 200 lepers 44·5 per cent. were positive ; of 373 natives whose symptoms warranted a suspicion of syphilis 48 per cent. were positive ; of 74 prisoners in the tuberculosis ward, taken without selection, 21 per cent. were positive. Of the total 647 natives 44 per cent. were positive. He notes that the percentage of positive reactions among lepers was just a little smaller than among the classes suspected upon clinical evidence of having syphilis. He is almost convinced that the difference between 21·6 in the average lower class

population and 44·5 per cent. among the lepers represents the difference in the amount of syphilisation of the two classes.

He has clinical and laboratory notes upon thirty cases of ulceration of the skin, in which tuberculosis, leprosy, sporotrichosis, actinomycosis and dermal leishmaniasis could be excluded from the diagnosis. Some were representative of gangosa; in all the diagnosis of tropical ulcer could be made. Of 27 ulcers in which there is record of the result of the Wassermann reaction 26, or 96 per cent. gave positive results. He has no hesitation in saying that in each case the native was suffering from syphilis. He notes that there is abundant clinical evidence to back up the Wassermann figures. He remarks that there is very little syphilis of the nervous system in Cavite Province and very few primary lesions are seen. He thinks the natives do not apply for treatment until they get mutilating ulcers.

In the remainder of the paper gangosa in Guam and the Philippines is discussed. He notes that the process may, and often does, affect any part of the skin and manifests a preference for those parts which are attacked by syphilis. Some of the arguments used for gangosa's being a new disease do not convince him. As regards the alleged absence of syphilis, the people came in contact with Europe and Mexico in 1521, and have been liable to infection ever since. The statement that the lesions are not curable by anti-syphilitic remedies is a mistake, as has been shown by Odell.*

He thinks there can be little doubt that gangosa is syphilis. He quotes a letter from Surgeon C. P. Kindleberger, in charge of the U.S. Naval Hospital at Guam, who states that "gangosa is now believed by us to be a tertiary manifestation of untreated yaws, possibly combined with an element of hereditary syphilis." The conclusions are as follows:—

"1. Syphilis and framboesia constitute a serious problem in public health in the tropics. They are the chief causes of the mutilating ulcerations of Guam and the Philippines.

"2. The Wassermann reaction is of incomparable importance in tropical medicine.

"3. Gangosa in Guam and the Philippines comes in the class of complement-absorbing diseases and is on this basis comparable to tabes dorsalis and general paresis."

[This writer appears to base the diagnosis of syphilis in lepers upon a positive Wassermann, though there are indications that he has doubts. The generally accepted opinion is that in leprosy a positive Wassermann can often be obtained quite apart from syphilis. Clegg found that 11 of 24 lepers responded to the Wassermann test, but none gave the luetin reaction. If Dr. Butler believes that so large a proportion of his lepers are syphilitic he must, if he wishes to carry conviction, furnish other evidence, such as the finding of the treponema.]

Eggers (H. E.). **i. On the Spirochaetal Infection of Ulcers in China.** —*China Med. Jl.* 1914. Nov. Vol. 28. No. 6. pp. 365–371.
ii. *Jl. Infect. Dis.* 1915. Mar. Vol. 16. No. 2. pp. 269–284. With 13 text-figs, 1 chart and 1 map.

i. The author, who writes from the Laboratory of Pathology and Bacteriology, Harvard Medical School of China, Shanghai, has by means of the organisation of the China Medical Missionary Association

**U.S. Naval Med. Bull.*, 1911, Vol. 5, p. 430.

examined smears from unselected cases of ulcers of the extremities sent to him from all parts of China. They were fixed at the laboratory in methyl alcohol and stained with Giemsa. Clinical data were few The following conclusions were reached :—

" 1. Some six different morphological types of spirochaetes have been found in leg ulcers from China.

" Of these, one [Type A] is known to be associated with a disease of fairly distinct clinical features. The pathogenic significance of the others is more doubtful, but one or two of them are quite possibly disease producers.

" 2. No constant relationship could be shown between the spirochaetes and fusiform bacilli, but apparently both may occur independently of each other.

" 3. Spirochaetes of the morphological type of those associated with tropical ulcer have been found in all degrees of abundance in smears from ulcers. When present in small numbers, the lesion apparently presents no distinctive clinical features.

" 4. As regards geographical distribution, the north, as nearly as may be judged from a ver ylimited amount of material, seems to be free from spirochaetal infections. They appear to be particularly frequent in central China, and less frequent, though present, in southern China. The same remark holds even to a greater degree, of the distribution of tropical ulcer. Hence this term, at least as applied to China, appears to be something of a misnomer."

Of the 1,500 specimens examined 115, or 7·6 per cent., showed spirochaetes. The commonest type (type A), found in 92 specimens, was a " long, very tenuous organism " about 13 microns in length with three to four regular convolutions of considerable amplitude. " Typical tropical ulcer is usually associated with large numbers of organisms of Type A." Another type, found in 49 cases, resembled the last but was usually irregularly and finely convoluted, about seven microns long ; its pathogenicity is considered less probable. Three types of bacilli, two fusiform, were seen. The spirochaetes were very rare in some specimens, very abundant in others. Most of the smears came from the Yangtse valley.

ii. An expanded form of the same paper. There are six photomicrographs of the spirochaetes found, chiefly type A ; photographs showing the lesions of tropical ulcer of the feet ; a chart showing the seasonal incidence ; a table of the geographical distribution of " spirochaete infected ulcers " ; and a map on which various data are indicated. It is noted that some evidence of increased frequency of spirochaetal infections was observed during the summer months, and that tropical ulcer appears to be most frequent in the early and late summer.

A. G. B.

Smits (J. C. J. C.). **II. Klinische waarnemingen omtrent het ulcus tropicum.** [With English Epitome.] [Clinical Observations on Ulcus tropicum].—*Geneesk. Tijdschr. v. Nederl.-Ind.* 1914. Vol. 54. No. 6. pp. 674–717. With 1 plate and 1 chart.

The author, who is in charge of the Central Hospital of the Sennah Rubber Company, Limited, Bila, Sumatra, bases his paper on the study of 241 cases. In his experience the chief cause of the disease is labour in the thin mud of the plantations. It is most prevalent in the months of largest rainfall, as is shown by a chart. Proof has not been furnished that the virus is able to penetrate the sound skin ; it enters either by

a pre-existing wound or together with something which causes a lesion. The symbiosis of VINCENT was found in all cases, the bacilli at the surface, the spirochaetes more deeply. Ulcus tropicum is most frequent on the lower extremities and next on the upper, but by infecting pre-existing wounds it is possible to produce the ulcer at any point of the body. It is noted that the hard skin of the sole and palm is always untouched. The ulcers at the borders of the toes were the most progressive and resistant to treatment. Syphilis and yaws frequently coexist with ulcus tropicum. If the case is treated in hospital prognosis is favourable. In uncomplicated cases hydrogen peroxide proved of great use; in such cases neither thermocautery nor sharp spoon are called for. For some complicated cases a saturated solution of picric acid is recommended. Many ulcers which defy surgical treatment are favourably influenced by salvarsan, even when syphilis or yaws are absent; this opinion is based on 50 cases.

A. G. B.

CHAMBERLAIN (Weston P.). **Spirochaetae and Fusiform Bacilli in Various Lesions in the Philippines.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1914. Oct. Vol. 2. No. 4. pp. 246–255. With 1 plate.

The author states that the fusiform bacilli associated with spirochaetes have been demonstrated in the following conditions:—Noma, ulcerative stomatitis, diphtheria, carious teeth, hospital gangrene, appendicitis, brain abscess, foetid bronchitis, gangrene of the lung, pyorrhoea alveolaris, syphilitic lesions of the mouth and fauces, ulcers of the skin, caries in the nose, lobar pneumonia, septic hand-infection and in apparently normal mouths and tonsils. These organisms, referred to as Vincent's, have been studied for the last ten years, but there is still much doubt as to their nature and action. Some believe that the bacilli and spirochaetes are different forms of a single micro-organism. Most investigators have been able to isolate only fusiform bacilli in cultures. Some think the organisms are protozoa.

During two years in Manila the author examined 106 patients with various lesions in the mouth and throat, with a view to determine the presence of fusiform bacilli and spirochaetes in smears from the exudates. In 53 per cent. of these cases the organisms were present in greater or less numbers, most commonly in lesions of the tonsils and the gums. Nearly all the patients showing the organisms were young adult males. From the literature and investigations of his own he thinks that these organisms are likely to be present in lesions of the mouth and fauces more frequently in the Philippines than in temperate climates. He notes that the spirochaetes come out clearly when stained with ordinary dyes, but do not take the colour at all with sulphuric-acid-methylene-blue, as used for demonstrating the tubercle bacillus; they are likely therefore to be missed.

He has once met with this association in ulcers of the skin. Such findings have been recorded by many observers in different parts of the tropics but do not seem to be common in the Philippines. The author states that the role played by spirochaetes and fusiform bacilli in these ulcers has not yet been worked out. In a discussion which

followed, Dr. S. B. Wolbach said that he had found spirochaetes and fusiform bacilli in phagedenic ulcers in the Gambia and had succeeded in staining them in sections of tissues in four cases in which they were deep in the tissues. He was inclined to think that these organisms had an etiological significance.

[M. Blanchard appears to have demonstrated that phagedenic tropical ulceration can be transmitted directly from man to man [see this *Bulletin*, Vol. 4, p. 36.]

A. G. B.

Whyte (G. Duncan). **Splenomegaly: being a Report on a Hundred and Four Cases met with in South China.**—*Ann. Trop. Med. & Parasit.* 1915. Jan. 29. Vol. 8. No. 4. pp. 659–674. With 3 charts.

The author first gives a list of the causes of splenomegaly, which is defined as chronic and very great enlargement of the spleen. In these cases, observed in the hospital at Swatow, polycythaemia and leukaemic conditions could be excluded by the blood counts, leaving malaria, kala azar, splenic anaemia (Banti's disease), and possibly histoplasmosis and Egyptian splenomegaly (Day and Ferguson) to be considered. Clinically it was "impossible to differentiate any one of the Swatow cases from Banti's disease." The history and symptoms of the cases are then considered with a view to their differentiation from malarial cachexia, Banti's disease and kala azar. For kala azar the description given by Rogers in "Fevers in the Tropics" is followed. In half the cases the disease came on between sixteen and twenty-five; 88 per cent. remembered having had fever. Haemorrhage was recorded in 61 per cent., diarrhoea in 50 per cent. The average length of the spleen, measured on the abdomen, was 23 cm. Apparently after six years it diminished.

With regard to the blood, leucopenia is present in all three diseases. The ratio of red cells to white cells in these cases was not that found in kala azar, according to Rogers, and the prognosis is quite different, 28 per cent. of Whyte's cases having lasted ten or more years.

Table VIII.—Showing the results of blood examination in various cases of enlarged spleen.

	Cases of Kala-azar.		Other Splenomegalies.	
Country	India	North China	South China	Egypt
Observer	Rogers	Cochran	Whyte	Day and Ferguson
No. of Cases	80	12	104	40
Erythrocytes	2½–4 million.	2,304,000	3,600,000	2,635,440
Leucocytes	700–2000	2,360	2,650	4,503
Ratio of white to red cells	Less than 1 : 1,500	1 : 1,200	1 : 1,713	1 : 585
Polymorphonuclears ..	—	47·5%	56%	62·8%
Polymorphonuclears per cmm.	Less than 2,000	1,121	1,486	2,828
Mononuclears, including lymphocytes ..	60%–80%	50%	39%	28·8%

In the Egyptian cases marked ascites was almost constant; in Whyte's series it was infrequent.

Histoplasma capsulatum has not been found in the peripheral blood of Swatow patients, but the spleen and liver have never been punctured. [Histoplasma was found in the tissues post mortem by DARLING.]

The conclusions are as follows:—

"1. That, in spite of a careful consideration of the symptoms and an examination of the blood, it is impossible to say whether the Swatow patients were suffering from malarial cachexia, histoplasmosis, or some hitherto undescribed condition.

"2. That one or more cases of splenic anaemia may have been included in the 104 Swatow splenomegalies, because the clinical differentiation of these two conditions is impossible.

"3. That if the cases which have been described are malarial cachexia, then some of the signs which have been found useful in India in differentiating malarial cachexia from kala-azar—e.g., the ratio of the leucocytes to the haemocytes—do not apply to patients in South China.

"4. That 'experience is fallacious and judgment difficult.'"

A. G. B.

MAXWELL (James L.). **Tropical Febrile Splenomegaly and its Surgical Treatment.**—14 pp. With 1 chart. [Paper read before a recent Conference of the China Medical Missionary Association.]

The author, who writes from Tainan, Formosa, states that this disease is common in the south of the island, so much so that it would be impossible to judge of the incidence of malaria by the splenic index. The patients are generally young to middle-aged men, workers in the fields and very poor. The disease appears to commence with fever, and patients are usually found to have fever when they come to hospital. The chief clinical signs are the great enlargement of spleen and liver. The legs are usually slightly oedematous. Epistaxis is common, haematemesis rare; dysenteric symptoms are relatively common. In advanced cases ascites occurs. No details are given of the blood picture, except that there is usually leucopenia. The author states that these are not cases of chronic malarial spleen, which yields well to treatment, nor are they cases of kala azar, which has not been found in Formosa.

The surgical procedure for the disease is splenectomy, which is advised for the following classes—Cases of splenomegaly with marked enlargement of the liver and leucopenia, or at least relative reduction of polymorphonuclear leucocytes; cases of splenomegaly with early ascites and a similar blood picture. In the pre-ascitic stage it holds out good hope of a permanent cure. The rest of the paper is concerned with the details of the operation. The conclusions are as follows:—

"1. There is a disease met with in Formosa, China, Egypt, and other places, characterised by progressive enlargement of the spleen accompanied by fever, and separate, though distinguished only with difficulty, from other diseases causing splenomegaly in the Tropics. For want of a better name we propose at present to retain that of febrile tropical splenomegaly.

"2. The disease commences with enlargement of the spleen which is soon followed by enlargement of the liver. In the early stages it may possibly be amenable to medical treatment. It is certainly curable by splenectomy.

" 3. Finally in a certain proportion, possibly all the cases, it passes on to contraction of the liver with ascites. The prognosis after operation at this stage is very doubtful, but without operation, and in cases beyond the reach of operation, it is always fatal.

" 4. The operation of splenectomy, if careful attention be paid to detail, is not very dangerous in suitable cases and the result if successful is well worth the risk run.

" 5. There is urgent need for systematic investigation into the diagnosis, prognosis, and etiology of this disease."

Whyte's paper is referred to in an appendix. His cases " probably include only a few " of those referred to here as he finds that " terminal ascites is comparatively rare."

A. G. B.

Deaderick (William H.). **The Differentiation of the Diseases associated with Splenomegaly.**—*Southern Med. Jl.* 1915. Mar. Vol. 8. No. 3. pp. 211–214.

The author discusses the clinical differentiation of the diseases met with in the Southern States in which there is marked enlargement of the spleen. These are, chronic malaria and malarial cachexia, distinguished by the author; splenic anaemia; leukaemia; Hodgkin's disease; pernicious anaemia (rarely); cirrhosis of the liver; syphilis; and others. In his experience splenomegaly is rarer in the negro than in the white race.

A. G. B.

East Africa Protectorate. i. **Nairobi Laboratory Report (Bacteriological Section). For the Months January-June, 1913.** Vol. 4. Pt. 1. By Philip H. Ross [Govt. Bacteriologist.]—19 pp. 1914. Nairobi: Printed by the Government Printer.

ii. **Nairobi Laboratory Report (Bacteriological Section). For the Months July-December. 1913.** Vol. 4. Pt. 2. By J. H. Harvey Pirie [Acting Govt. Bacteriologist].—17 pp.

i. In the period under review 1,863 examinations were made in the Nairobi Laboratory. Half of these were blood smears, many of which showed evidence of malaria (parasites in 123 cases, 113 subtertian). There were 27 positive Widal reactions. Of positive examinations for plague there were 23 in man, 28 in rats. *Bacillus leprae* was found once. The meningococcus was found in 88 specimens of cerebro-spinal fluid. A table shows that cases of human plague occurred in Nairobi in January, February, March, April and June, 14 in all, and that infected rats were found in the same months. The number of rats was insufficient for the author to decide whether rat plague is present all the year round or occurs only in epizootics. With regard to small-pox an increased demand for lymph dried *in vacuo* is noted; unfortunately its preparation takes much time. Experiments to determine the animal reactions of the trypanosome conveyed by *G. longipennis** are detailed. Attempts to transmit it by this

* See this *Bulletin*, Vol. 1, p. 505.

species from infected to clean monkeys appeared to fail, but it is noted that the temperatures of the latter were often suspicious. The Report closes with meteorological tables for the six months.

ii. Dr. Harvey PIRIE, the writer of this Report, relieved Dr. Ross on November 6th, so that he was in charge for only seven weeks. 3,726 examinations were made in the six months, an increase mainly accounted for by the large number of rats brought to the laboratory. Material from six cases of human plague was received, two from Nairobi, the rest from elsewhere. Of 2,682 rats examined six only were infected, all in July and August. An examination of the Nairobi drinking water was commenced. The tap water gave on MacConkey's medium 8 organisms per cc., two of which corresponded very closely with typical *B. coli*. The introduction of a filter bed below the reservoir or at the tanks is suggested. There were issued from the laboratory 166,200 doses of vaccine, 3,240 in dried form (Achalme-Phisalix method), the rest glycerinated.

A. G. B.

BAERMANN (G.). **Behandlungsversuche mit Salvarsankupfer. (Frambösie, Malaria, Amöben Dysenterie, Lepra).** [Experimental Treatment with Salvarsan Copper.]—*München. Med. Woch.* 1914. Jan. 6. Vol. 61. No. 1. pp. 1–5. With 2 figs.

This substance was sent by EHRLICH to the author in Sumatra for trial in amoebic dysentery. It is a complex compound prepared by EHRLICH and KARRER. KARRER'S investigations showed that the copper is united with the arsenic group and not with the amidophenol. It is a yellowish-red fine powder which is kept in closed ampoules under neutral glass. It is dissolved in double normal soda solution, and is always used intravenously. It can be given three times at intervals of two days; the maximum dose the author found to be 0·15 gm. The drug was used in 45 cases. An account of these is given. The conclusions were to this effect:—

K_s, as the product is called for convenience, acts powerfully in yaws (22 cases); according to the impression of the author even more powerfully than salvarsan. The spirochaetes disappear in 24, or at the most 48 hours. Even the severest manifestations heal, as is shown by a figure, extremely quickly. In 9 cases out of 13 the Wassermann reaction was changed from positive to negative by a single injection of 0·1 gm. In the single case of quartan malaria the treatment was curative. In four cases of tertian there has hitherto (two months) been no relapse; in another case with very numerous parasites there was a relapse, or possibly reinfection. In two cases of pernicious fever in which there were only small rings and no gametes, the patient had remained free from parasites for two months; five cases of pernicious malaria which showed young gametes and crescent were not influenced. In two cases of amoebic dysentery K_s was found to be quite without action. In one case of mixed leprosy there was an undoubted influence on the nodules, ulcerations and general condition.

The author states that these results have only a problematical value, but show that the remedy has great chemotherapeutical power. Further investigations will find the suitable doses. Experiments were to be repeated on a larger scale.

A. G. B.

Langeron (Maurice). **Rémarques sur l'Emploi du Peroxyde de Benzol en Hématologie Coloniale.**—*C. R. Soc. Biol.* 1914. Mar. 27. Vol. 76. No. 11. pp. 502–503.

As a rule it is very difficult to stain with Romanowsky old blood smears, especially those which have been made in the tropics and sent to Europe. With the lapse of months the red cells become more and more basophile, the parasites stain very badly and their nuclei are difficult to demonstrate. The author has tried peroxide of benzol (lucidol), introduced by Szecsi, to rejuvenate smears of malarial blood collected in Tunis in 1911 and smears of horse blood containing *T. cazalboui*, made by Joyeux in West Africa in 1908. The result was very good. The subsequently stained malarial parasites showed clearly the characters of their protoplasm and nucleus; the granules of the parasited red cells still stained with difficulty. The trypanosomes, which were almost unstainable, showed clearly the nucleus and blepharoplast. Peroxide of benzol is found in commerce in the form of a fine white powder insoluble in water; it is an energetic oxidiser. The author uses it dissolved in 10 per cent. acetone. The smears to be fixed, which must be quite dry, are left in it from 10 to 15 minutes in a well-corked receptacle; they are then washed several times in a mixture of three parts acetone and two parts toluene, to get rid of the crystals of peroxide of benzol which form. The preparations are then passed into pure methyl alcohol and stained by Pappenheim's method: one minute in a mixture of equal parts of May-Grünewald solution and distilled water and 15 to 20 minutes in Giemsa, three drops in 2 cc. distilled water. The solution of peroxide of benzol in acetone must be thrown away as soon as it forms crystals

A. G. B.

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RABINOWITSCH (M. M.). The Agent of Exanthematous Typhus. (Diplobacillus exanthematicus). [In Russian.]—177 pp. With 7 plates and 74 charts, 1914. Charkov : Tip. Zipberberg.

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